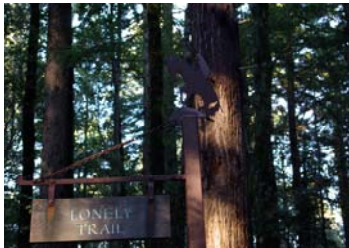


BAY AREA RIDGE TRAIL - HIGHWAY 92 TO HUDDART COUNTY PARK

TRAIL ALIGNMENT FEASIBILITY STUDY



4/21/08

Summary Report



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Summary Report

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Prepared for
San Mateo County Parks Department

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CHAPTER 1

Background and Existing Conditions

PROJECT DEFINITION

The purpose of this study is to determine the feasibility of constructing a new portion of the Bay Area Ridge Trail (“Ridge Trail”) located in San Mateo County. The intent is to close a gap in the existing Ridge Trail from Highway 92 to Huddart County Park.

The study defines a preferred alignment and an alternative alignment, and locates appropriate supporting facilities. It establishes trail design guidelines, and outlines a process for further planning and implementation.

FUNDING

This study was made possible in part through funding from the California Coastal Conservancy.

THE RIDGE TRAIL CONCEPT

More than twenty years ago, National Park Service Director William Penn Mott, Jr. envisioned a trail that would ring the San Francisco Bay, high on the ridge line. Although he only lived to see part of the trail completed, he inspired a dedicated grassroots effort that has worked to implement the trail. Representatives of the Golden Gate National Recreation Area and the Greenbelt Alliance organized the Bay Area Ridge Trail Council in 1987. They hoped to preserve open space by creating managed public access to a trail along the ridge tops. This initial partnership brought together public park agencies and trails advocates from all around the region to map out a route for the Ridge Trail and establish an organization to promote its completion.

Today, approximately 300 of the 590 miles of trail have been constructed.

Bay Area Ridge Trail Council

The Bay Area Ridge Trail Council (“Council”) became an independent 501(c)(3) nonprofit organization in 1992. It works in close partnership with local governments, public agencies, nonprofit land trusts, and local grassroots activists in the nine counties of the Bay Area to complete the Ridge Trail. The Council’s ultimate goal is to provide a continuous multi-use trail for mountain bicyclists, equestrians, and hikers/trail runners.

Volunteers lead the effort to build the Bay Area Ridge Trail, supported by a small, dedicated staff. Together, the Council and volunteers work county-by-county to add new segments of the trail. Their efforts leverage and support the work of state and regional parks and open space groups, and their success is the result of their ability to forge effective partnerships.

The Council enjoys strong community support, with over 3,500 members and 200 volunteers actively involved in permanently preserving the Ridge Trail through a network of connected and accessible parks and open spaces. The Council receives diverse funding support through members, donors, foundations, corporate supporters, and special events. Since 2001 the Council has established a partnership with the California Coastal Conservancy to help complete the trail. Bond funding approved by the voters in 2000 and 2002, has also provided grants of nearly \$3 million.



COLLABORATING AGENCIES

This study is a cooperative effort among several resource agencies having jurisdictional or other interest in the lands along the corridor. Each agency helped direct the planning effort through participation on the steering committee. These agencies include:

- Bay Area Ridge Trail Council (“Council”): The Council is responsible for coordination and review of the planning effort.
- San Mateo County (“County”): The County of San Mateo Department of Parks is the lead agency for this planning effort. The County owns the portion of the alignment located in Huddart Park.
- U.S. Department of the Interior, National Park Service (“NPS”): The NPS owns the portion of the alignment located in the Phleger Estate, a unit of the Golden Gate National Recreation Area.
- San Francisco Public Utilities Commission (“SFPUC”): The SFPUC owns the longest portion of the alignment (approximately 5 miles), which occurs on the San Francisco Peninsula Watershed lands.
- Midpeninsula Regional Open Space District (“MROSD”): MROSD owns the Purisima Creek and Mills Creek Open Space Preserves located on the west side of Skyline Blvd. Although the proposed trail alignment does not pass through MROSD lands, the District’s participation needed to coordinate the planning effort with their existing and future trail systems that connect to the Ridge Trail. In addition, the existing parking area at the southern entrance to Purisima Creek is currently used to access the Ridge Trail at Huddart Park.

LOCATION

The study area is located in central San Mateo County along the Skyline Ridge, extending from Highway 92 at Highway 35 (Skyline Blvd.), south to Huddart County Park. The trail alignment is envisioned to be located on the east side of Skyline Blvd. running roughly parallel to the road.

DESCRIPTION OF STUDY AREA ENVIRONMENT

Topography

The proposed trail is located in an area of steeply sloping, mountainous terrain. Some portions of the ridge have a relatively narrow shelf of gently sloping terrain above the east facing slopes. Other portions, particularly in the northern two-thirds, have no, with slope

descending directly from the road edge. The slopes that drop off the ridge are typically from 30% to 70%. Elevations vary from 880 feet above sea level at the northern limit, to 2000 feet above sea level at the southern junction with the existing Ridge trail. A few locations immediately north of the southern limit rise to 2060 feet. The slopes are cut by several drainages that create a series of ridges and valleys across which the trail will traverse.

Soils and Geology

Three soil types occur in the immediate area:

- Soil Unit 104 Alambique – McGarvey Complex

This soil unit covers most of the southern 2/3 of the study area, and generally conforms to the forested areas. It is composed of 45% Alambique gravelly loam, 35% McGarvey loam, and 20% other soils. Alambique and McGarvey soils are moderately deep and formed from soft sandstone, with a depth to bedrock of 20 to 40 inches. This soil unit also contains small amounts of other soils and rock outcrops. The main limitation for trail construction is identified by the N.R.C.S. as being the steep slopes. Trail construction and grading should be relatively easy based on the depth of soil and the soft nature of the bedrock.

- Soil Unit 105 Barnabe-Candlestick Complex

This unit is prevalent on the northern 1/3 of the project area and generally conforms to the coastal scrub areas. It is composed of 45% Barnabe very gravelly sandy loam, 35% Candlestick fine sandy loam, and 20% other soils. The Barnabe soil is very shallow and is well drained. It is formed from hard fractured sandstone, with a depth to bedrock of 8 to 20 inches. Trail construction will be made more difficult by the shallow soil layer and hard bedrock of the Barnabe soil. The Candlestick soil is moderately deep and well drained. It is formed from hard, fractured sandstone, with a depth to bedrock of 20 to 40 inches. Although the soil profile is thicker than that of the Barnabe soil, trail construction will be made more difficult by the hard nature of the bedrock. The main limitations for trail construction are the slope, the susceptibility of the Candlestick soil to slippage, and the restricted depth to bedrock of the Barnabe soil.

BARNABE SOIL AND WEATHERED BEDROCK, CALTRANS PARKING AREA



- Soil Unit 109 Candlestick-Barnabe Complex

This unit occurs in limited areas very close to the ridgeline in the northern 1/3 of the study area. It is similar to soil unit 105, which typically lies next to and downslope of this unit, except for the percentages of the two main soil types contained in the unit, which are 45% Candlestick and 25% Barnabe. The main limitation for trails development is the slope.

Further soils information is included in the appendix.

Geologic Hazards

POTENTIAL FOR LIQUEFACTION

The potential for liquefaction is not considered to be a significant hazard for this project. The study area's location on the high ridge minimizes the potential for soil liquefaction. A very small probability of soils susceptible to liquefaction occurs in some of the drainage bottoms.

The U.S.G.S. classifies susceptibility to liquefaction as follows:

- Very Low: less than 0.01% probability of liquefiable sediment within the map unit
- Low: 0.01% to 0.1% probability of liquefiable sediment within the map unit
- Moderate to Low: 0.1% to 1.0% probability of liquefiable sediment within the map unit

Most of the alignment is in the “very low” zone, with approximately 10% of the length occurring in the “low” and “moderate to low” zones.

The source for this data is Map I-1257-G published by the U.S.G.S., entitled “Map Showing Liquefaction Susceptibility of San Mateo County, California” by T. Leslie Youd and Jeanne Perkins, dated 1987.

SLOPE STABILITY

Slope failure is a possibility in this area. The San Andreas Fault lies approximately one mile east of the proposed alignment. Based on data available from the U.S.G.S., the entire study area is located in the “Moderate” classification, meaning that up to 15% of the area shown on the map under the “moderate” designation is likely to fail in an earthquake.

The source for this data is Map I-1257-E published by the U.S.G.S. entitled “Map Showing Slope Stability During Earthquakes in San Mateo County, California” by Gerald F. Wieczorek, Raymond C. Wilson, and Edwin L Harp, dated 1985.

Potential slope failure could pose a hazard to human safety in the event that a landslide is triggered during an earthquake. However, the majority of trails in similar environments in the San Francisco Bay Area are susceptible to the same hazard level.

Hydrology

The study area contains numerous drainages and intermittent streams. The proposed trail routing generally lies above the heads of the drainages so as to avoid conflicts with sensitive resources and additional construction expense. The alignment does however cross several of the drainages. It is also likely that the alignment will cross localized seepages or springs. All the drainages within the alignment on SFPUC lands flow into Upper Crystal Springs Reservoir which is a protected drinking water reservoir.

Views

The location on the high east-facing ridge affords dramatic views. From various vantage points, the San Francisco city skyline, Upper and Lower Crystal Springs Reservoirs, the San Francisco Bay, the East Bay hills, and Mt. Diablo may be viewed.

Biology

The proposed alignment traverses five main plant communities: northern coastal scrub, mixed evergreen forest, Douglas fir forest, redwood forest, and non-native tree groves. A detailed description of the study area biology is presented in the Biological Assessment prepared by the Biotic Resources Group (see appendix).

POTENTIAL ENVIRONMENTAL IMPACTS

The project has the potential to impact the environment in a number of ways. Potential impacts will be identified in an Initial Study and then addressed in the appropriate form of environmental document in accordance with the California Environmental Quality Act (CEQA). Note: CEQA could be satisfied with a mitigated negative declaration in lieu of an EIR if the project description includes avoidance and minimization measures. Impacts may include:

- Impacts on sensitive plant and animal species and habitats
- Wetlands and in-stream habitat impacts
- Removal of mature trees, primarily in Segments 3 – 6.
- Traffic impacts of increased use and potential new parking areas
- Impacts to visual resources

- Increased fire risk
- Impacts to protected water supply
- Impacts to water quality
- Impacts to scenic resources
- Impacts to cultural resources
- Tree health impacts
- Increased impacts due to invasive plants

CHAPTER 2

Proposed Trail Alignment

This chapter describes a preferred trail alignment and an alternative alignment. The alignments were established using a combination of on-site reconnaissance, air photo interpretation, and utilization of GIS-based topographic maps.

ALIGNMENT DESCRIPTION – PREFERRED ALIGNMENT

The proposed trail alignment begins at the existing Caltrans parking area located at the intersection of Highway 92 and Skyline Blvd., and ends at the existing Ridge Trail in Huddart County Park. The proposed alignment is described in this report traveling from north to south. The alignment is divided into six segments that respond to local topographical conditions.

Segment I

**Summary Table –
Segment I**

| | |
|--|--|
| Land Ownership | SFPUC |
| Existing Trail Status | All-new trail |
| Trail Length (approximate) | 7,900 feet (1.5 miles) |
| Topography | Steeply sloping terrain: series of ridges and ravines |
| Side Slopes | 20% to 75% |
| Hydrology | Crossings of 3 intermittent drainages |
| Soils | 105 Barnabe-Candlestick Complex 109 Candlestick-Barnabe Complex |
| Vegetation | Northern Coastal Scrub with a few non-native tree groves |
| Experiential Factors | Good views to east; road noise on portions of trail in close proximity to the highway; open, expansive terrain; less feeling of isolation than in forested segments |
| Trailheads, Parking, Connections with Other Trails | Caltrans parking area at 92 and 35 intersection; no trail connections to other trails other than northbound continuation of Ridge Trail across Highway 92. Potential location for an accessible (ADA) trailhead. |
| Proposed Tread Width | 8 feet optimal; 6 feet minimum on steeper portions; with intermittent turnouts and access spurs to Skyline Blvd. for maintenance and patrol. |



SEGMENT I: VIEW SOUTH FROM ABOVE HIGHWAY 92. CALTRANS PARKING LOT VISIBLE IN LOWER RIGHT.



SEGMENT I: VIEW NORTH FROM SECOND SWITCHBACK ON HIGHWAY 35. NOTE STEEP TERRAIN.



SEGMENT 1: VIEW EAST TO S.F. BAY AND MT. DIABLO

Segment 1 traverses steeply sloping terrain across a series of ridges and ravines. It crosses two intermittent drainages, which will require stream crossings, and one ephemeral drainage that would require a culvert or ford (hardened low water crossing). The trail encounters two steep sections between the two intermittent drainages that make passage of this area difficult but not insurmountable (see map). Segment 1 is characterized by open chaparral that allows expansive vistas. Dense stands of poison oak occur along the entire length of this segment. A tread width of eight feet is the goal with six foot wide allowable where an eight foot width would cause too much disturbance and/or require retaining walls.

Segment 2

**Summary Table –
Segment 2**

| | |
|--|---|
| Land Ownership | SFPUC |
| Existing Trail Status | All-new trail |
| Trail Length (approximate) | 19,100 feet (3.73 miles) |
| Topography | More gently sloping terrain near the road, with moderately sloping terrain at the military crest and upper portion of the east-facing slope |
| Side Slopes | 10% to 75% |
| Hydrology | Intermittent drainages |
| Soils | 105 Barnabe-Candlestick Complex 109 Candlestick-Barnabe Complex |
| Vegetation | Northern coastal scrub predominating, with non-native trees at the northern end, and mixed evergreen/douglas fir forest at the southern end |
| Experiential Factors | Mostly open and expansive; some enclosed forested areas; some good views to east; road noise on portions of trail in close proximity to the highway |
| Trailheads, Parking, Connections with Other Trails | No existing trailheads; potential new trailhead on east side of road at Mills Creek O.S.P.; no existing nor proposed connections to other trails. Potential location for “an accessible user only” (ADA) trailhead. |
| Proposed Tread Width | 8-10 feet with turnouts |

Segment 2 begins in a stand of non-native trees and proceeds southerly through coastal scrub. The alignment is able to take advantage of a broad shelf at the top of the slope so that grading and disturbance are minimized. This will also permit a wider trail section, with widths of 8-10 feet being feasible. The alternative alignment follows an existing fire break on the upper shelf that could accommodate a 12 foot trail width. Design (and possibly phase 1 construction) of this segment should include a future connection to the west across Skyline Blvd with Mills Creek O.S.P.

Portions of segment 2 could provide accessible (ADA) trail user opportunities. This area would be from approximately ¼ mile north of the Mills Creek O.S.P. parcel south to Misty Ridge Rd. There is a potential location in this area for an “accessible user only” (ADA) trailhead on the east side of Skyline Blvd. Note: See the Parking, Trailheads, Fencing and Highway Crossings section for the discussion of trailheads east of Highway 35.



SEGMENT 2: VIEW NORTHEAST TO CRYSTAL SPRINGS RESERVOIR, SAN BRUNO MOUNTAIN, SAN FRANCISCO CITY SKYLINE, AND MARIN HEADLANDS



SEGMENT 2: VIEW NORTH. NOTE BROAD SHELF AT RIGHT

Segment 3

**Summary Table
– Segment 3**

| | |
|--|--|
| Land Ownership | SFPUC |
| Existing Trail Status | All new trail |
| Trail Length (approximate) | 9,900 feet (1.87 miles) |
| Topography | Very gently sloping with a short section of moderate side slope at northern end |
| Side Slopes | 5% to 30% |
| Hydrology | Intermittent drainages |
| Soils | 104 Alambique – McGarvey Complex |
| Vegetation | Mixed evergreen/douglas fir forest at northern end giving way to redwood forest for majority of segment |
| Experiential Factors | Densely forested area with feeling of isolation; less road noise than Segments 1 and 2 |
| Trailheads, Parking, Connections with Other Trails | Existing trail head and restroom at Purisima Creek O.S.P. parking lot; no proposed new trailheads; no existing nor proposed connections to other trails within study area on east side of road; connection to Purisima Creek O.S.P. trails on west side of Skyline Blvd. The connection between SFPUC lands and the Phleger Estate (trail segments 3 and 4) would be in the area of the existing pedestrian gate on the Southern Fuel Break. |
| Proposed Tread Width | 6-8 feet with intermittent turnouts |

Segment 3 is much the same as Segment 2 in regards to topography, side slopes and hydrology except that it is forested over the entire length of the segment. There are significant stands of old and second growth Douglas Fir and Coast Redwood occurring on this segment. The primary difference in the experiential qualities between the two segments is the visually-enclosed vs. open space nature of the area. The choice of trail width and the location of the trail center line will be a critical consideration in the design of this segment. The main issues of concern related to these design criteria are minimizing tree removal and mitigating potential tree health impacts.



SEGMENT 3: DOUGLAS FIR FOREST

Segment 4

**Summary Table –
Segment 4**

| | |
|--|--|
| Land Ownership | National Park Service |
| Existing Trail Status | All new trail |
| Trail Length (approximate) | 6,000 feet |
| Topography | Very steeply sloping at northern end, giving way to gently sloping land at southern end near the fire station |
| Side Slopes | 5% to 75% |
| Hydrology | Intermittent drainages |
| Soils | 104 Alambique - McGarvey |
| Vegetation | Redwood forest |
| Experiential Factors | Very densely forested with strong feeling of isolation due to topography |
| Trailheads, Parking, Connections with Other Trails | No existing nor proposed trailheads; connection to existing narrow trail from fire station to Mountain Home Restaurant |
| Proposed Tread Width | 6 feet along existing trail north of fire station; 4 feet on steeper sections |



SEGMENT 4: INFORMAL FOOTPATH WITH 75% SIDE SLOPES (COUNTY TRAILS PLAN TRAIL# P-18)



SEGMENT 4: EXISTING WIDE PATH JUST NORTH OF KING'S MOUNTAIN FIRE STATION

Land ownership changes from the SFPUC to the NPS at the boundary of Segments 3 and 4. This segment is identified in the County Trails Plan as potential trail “P-18”. After leaving a gently sloping ridge just south of the SFPUC lands, Segment 4 traverses very steeply sloping terrain in its northern portion located just below the private properties on the east side of the road. It is anticipated that very little if any of this steeper section will be feasible for a 6 foot wide trail section. It is recommended that this part of the trail be constructed to a 4 foot width. It is anticipated that a fair amount of tree removal would be necessary.

Once past the steep section, the trail joins an existing path located on the broad shelf close to the road and continues south to the King’s Mountain Fire Station. Most parts of this segment are isolated from the road by topography and vegetation. However a section of the steeper portion comes close enough to several private homes for trail users to see into residential back yards. The section immediately north of the fire station is located relatively close to the road, which reduces the feeling of isolation along this stretch.

Segment 5

Summary Table – Segment 5

| | |
|--|--|
| Land Ownership | National Park Service |
| Existing Trail Status | Alignment uses a portion of existing Lonely Trail |
| Trail Length (approximate) | 2,150 feet |
| Topography | Gently sloping |
| Side Slopes | 5% to 25% |
| Hydrology | Intermittent drainages |
| Soils | 104 Alambique - McGarvey |
| Vegetation | Redwood forest |
| Experiential Factors | Densely forested area; trail runs relatively close to road, some road noise is audible |
| Trailheads, Parking, Connections with Other Trails | Connection to existing eastbound Lonely Trail; no existing nor proposed trailheads |
| Proposed Tread Width | 6 feet |



SEGMENT 5: EXISTING LONELY TRAIL TO BE WIDENED FOR DESIGNATION AS THE RIDGE TRAIL

Segment 5 uses a portion of the existing Lonely Trail in the Phleger Estate. The terrain is gently sloping. A 6 foot trail width is feasible. This will require selective tree removal and tread widening.

Segment 6

Summary Table – Segment 6

| | |
|--|--|
| Land Ownership | County of San Mateo |
| Existing Trail Status | Alignment uses a portion of existing Skyline Trail |
| Trail Length (approximate) | 1,750 feet |
| Topography | Gently to moderately sloping |
| Side Slopes | 5% to 20% |
| Hydrology | Intermittent drainages |
| Soils | 104 Alambique - McGarvey |
| Vegetation | Redwood forest |
| Experiential Factors | Densely forested area; trail runs relatively close to road, some road noise is audible |
| Trailheads, Parking, Connections with Other Trails | Existing parking and restroom on west side of road at Purisima Creek O.S.P. |
| Proposed Tread Width | 6 feet |



SEGMENT 6: EXISTING SKYLINE TRAIL IN HUDDART PARK TO BE WIDENED IN LOCALIZED AREAS FOR DESIGNATION AS THE RIDGE TRAIL

Segment 6 utilizes the existing Skyline Trail within Huddart County Park. Segment 6 terminates at the intersection of Skyline Trail and the Archery Fire Road, where it joins the existing Ridge Trail continuing south to Wunderlich County Park. A 6 foot width is feasible. This will require minimal selective tree removal and localized widening. The existing trail is located relatively close to the road, which is visible from portions of the trail. Therefore, the feeling of isolation is much reduced, in spite of the dense redwood tree cover.

The existing Ridge Trail proceeds south from Huddart County Park to Wunderlich County Park. Parts of this portion occur on private property within an easement. The tread is as little as two feet wide in this portion. Consideration should be given to improvements in this area.

ALIGNMENT DESCRIPTION – ALTERNATIVE ALIGNMENT

The alternative alignment is located as close to the road as possible for much of its length. The advantages to this approach are that it would create less environmental disturbance, would be a shorter and therefore less expensive route, and would permit a wider trail section. Although this alignment as described on SFPUC lands is the alignment most consistent with the SFPUC Peninsula Watershed Management Plan it is not the alignment recommended by SFPUC staff. The preferred alignment illustrated on the plans is the alignment recommended by SFPUC staff.

The disadvantages with the alternative alignment are largely experiential. The alternative alignment would offer a less remote wilderness experience, would be located in the more disturbed parts of the study area, and would provide fewer views. The alternative alignment would also present less of a physical challenge, which may be viewed as an advantage or a disadvantage depending on one's orientation. Analysis of this alternative for consistency and compliance with the Americans with Disabilities Act would be required.

In Segment 1, it is neither feasible nor desirable to locate a trail close to the road due to the extreme terrain. Therefore no alternative alignment has been identified. SFPUC staff concurs with this finding.

Beginning in Segment 2, the alternative alignment takes advantage of the broad shelf next to the road, and runs along the existing fuel break along most of its length. This trail would be located in the open chaparral with a high degree of visual and auditory contact with the road. It would also offer fewer views due to its distance from the military crest.

In Segment 3, the alternative alignment would be located close to the road but would have the benefit of significant redwood forest cover for its entire length.

Segment 4 does not contain an alternative alignment due to the extreme nature of the topography, and also due to the presence of private property that occupies the east side of the road. Segments 5 and 6 do not contain an alternative alignment because of the use of existing trails.

Design and Construction

TRAIL DESIGN GUIDELINES

The Ridge Trail is intended for multiple use: to accommodate hikers, mountain bicyclists and equestrians along a single alignment. The Council adopted a policy in 1994 and revised it in 1998 which recognizes the three trail user groups and commits to achieving a multi-use trail wherever feasible. Priority for dedication is given to multi-use sections.

Trail design guidelines have been established by the Council and by the San Mateo County Trails Plan. These guidelines are included in the appendix. This feasibility study has adapted these guidelines to be appropriate for this portion of the Ridge Trail.

- Trail Width

A minimum six foot tread is the recommended goal. Although the Council's guidelines allow a multi-use trail to be a minimum of four feet wide, six feet would facilitate the use of small emergency, maintenance, and construction vehicles. Localized conditions may require the trail to be four feet in width, which would still meet the Council's criteria. Detailed field investigation may reveal localized areas where a multi-use tread is not achievable. A trail width of 8 to 10 feet is desirable on the more gently sloping parts of the trail, such as in parts of Segment 2 and 3. This additional width would make light service and emergency vehicle access easier.

- Trail Gradients

The proposed alignment was laid out to achieve a longitudinal slope of 10% or less. This should be the maximum grade sustained over significant lengths. The maximum grade over a 500 foot length should be 15%. Trail design should attempt to achieve lower gradients wherever possible to enhance accessibility.

- Clearances

A nine foot vertical and one foot horizontal clearance measured from the edge of the tread should be provided.

- Surfacing

Natural soil is recommended as the default surfacing. Supplemental road base may be need in localized areas to mitigate wet conditions at seeps, drainages, etc.

- Cut and Fill

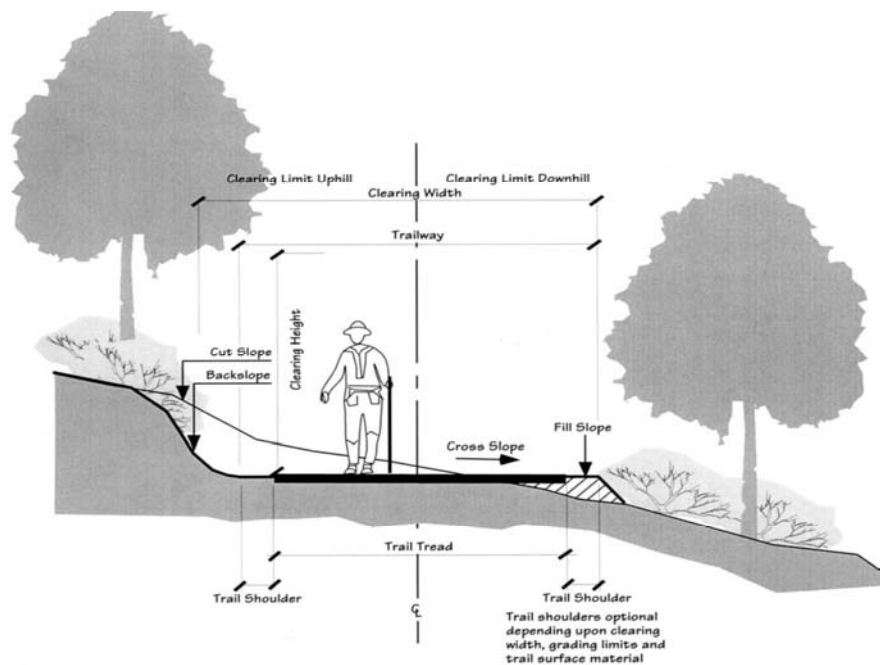
Wherever possible, the trail should be constructed entirely in cut. This will provide the most stable trail surface and will reduce future trail maintenance costs. Surplus material should be sidecast downslope, with care taken not to deposit material within the drip line of existing trees.

- Drainage

Best practice trail drainage measures should be followed. An outsloped trail surface is recommended wherever possible. Rolling dips are preferred over water bars. Drainages should be crossed with pedestrian bridges, fills over culverts, or hardened fords as appropriate.

- Fencing

Segments 1-3 will require fencing per SFPUC specifications.



TRAIL DESIGN TERMINOLOGY

Source: San Mateo County Trails Plan, page 43, Chapter 4, Figure 2

- ADA

The alignment will require analysis for consistency and compliance with the Americans with Disabilities Act.

- Restrooms

A restroom will be required at the staging area for Segment 1 at Highway 92. Restrooms for a mid-alignment ADA accessible staging area (if constructed) will also be required.

- Emergency and Maintenance Vehicle Access

The trail should have vehicular gates at approximate 1 mile intervals to allow emergency and maintenance vehicle access.

- Path Pull-Outs

The trail should have pull-outs installed as feasible to permit passing on constrained width sections.

PARKING, TRAILHEADS, AND HIGHWAY CROSSINGS

Three existing parking areas will service this section of the Ridge Trail. The Caltrans lot at Highway 92 provides access to the northern end of this section. A restroom and emergency phone should be added to this trailhead and at the mid-alignment ADA accessible staging area (if constructed) on SFPUC lands.

The parking area on the north end of Purisima Creek O.S.P. is located on the west side of Skyline Blvd. A restroom is provided. Ridge trail users will need to cross the road to access the trail. The parking area's location close to a bend in the road presents sight distance problems. Future trail planning will need to develop appropriate design measures and engage



PURISIMA CREEK SOUTHERN PARKING AREA VIEWED FROM SKYLINE TRAIL TRAILHEAD IN HUDDART COUNTY PARK

Caltrans to minimize traffic hazards at this crossing. A transportation engineer should be consulted. A connector spur trail is also necessary at this location to connect users from the parking area to the Ridge Trail.

The existing parking area on the south end of Purisima Creek O.S.P. is located on the west side of Skyline Blvd. directly across from Huddart Park. A restroom is provided. This trailhead is currently used by trail users, who must cross the road to

access the trail system in Huddart Park. The location of the parking area and the entrance to the Huddart Park trails are slightly offset, with the parking area approximately 50 yards north of the entrance to Huddart Park. It may be desirable to install directional signage and a split rail fence on the west side of the road to channel people from the parking area to a crossing location directly opposite the Huddart Park entrance. This would reduce the traffic exposure of pedestrians who may cross the road on an angle, which increases the amount of time they are in the roadway. Future trail planning will need to develop appropriate design measures and engage Caltrans to minimize traffic hazards at this crossing. A transportation engineer should be consulted.

A potential new trailhead has been identified by MROSD, located at the Mills Creek O.S.P. where it abuts Highway 35. This potential trailhead presents similar road crossing issues as do the two existing Purisima Creek trailheads. Future trail planning will need to develop appropriate design measures and engage Caltrans to minimize traffic hazards at this crossing. A transportation engineer should be consulted. A connector spur trail is also necessary at this location to connect users from the parking area to the Ridge Trail.

There may be other opportunities to establish small parking areas in the State right-of-way on the east side of Highway 35. Any new parking areas will need to be planned in conjunction with Caltrans.

It is also possible that new parking areas could be created on SFPUC, NPS, or County lands outside of the State right-of-way. The advantage would be that trail users would not need to cross the highway to access the Ridge Trail. New parking areas on the east side of Skyline Blvd. may not be consistent with the Peninsula Watershed Management Plan (WMP) and SFPUC best management practices. Significant mitigation may be necessary to eliminate potential impacts to water quality and upslope biological resources. The added cost of the mitigation and the maintenance and security associated with new parking areas in relation to the overall cost of the project will be considered by the SFPUC. SFPUC staff opinion is that new parking areas that drain into the hydrologic watershed of Upper Crystal Springs Reservoir would not be appropriate. A relatively small ‘accessible user only’ parking and staging area may be appropriate and consistent with the Plan. On SFPUC land, the relatively level, open area at the midpoint of the straight roadway section on Map 2 may be a logical location for an “accessible user only” parking and staging area. No tree removal would be required.

Any new parking areas should be designed in consultation with a transportation engineer.

On NPS land, a possibility is the area just north of the King’s Mountain Fire Station. A new trailhead could utilize the existing vehicular access to the fire station and be constructed just

to the north. This location would also require some tree removal. Potential impacts to the King's Mountain Art Fair would need to be evaluated.

At Huddart County Park, it has been mentioned that a new parking may be feasible at the Ridge Trail crossing of Highway 35 (southern limit of this project study area). This location would require significant grading and redwood tree removal, and should be studied carefully if there is interest in pursuing this option.

FENCING, GATES, AND SIGNAGE

The alignment connects to several trails in Phleger Estate and Huddart County Park that are not open to bicyclists. Regulatory signage and self-closing gates should be installed at each of these connections.

A series of gates with standardized signage will be needed to facilitate trail closure during inclement weather, hazardous fire conditions, or for other reasons. The three agencies should adopt a standard gate and signage program.

Fencing will be required along the alignment on SFPUC lands (segments #1-#3).

CONSTRUCTION COSTS

Construction costs will depend on the specific conditions encountered along the alignment. Labor will be the primary contributor to project cost, as the trail will be built with hand labor and with small scale trail building machines.

The level of detail contained in this feasibility study is not sufficient for estimation of probable construction costs. For planning purposes only, one might apply a budget of \$50.00 to \$100.00 per linear foot of trail to the 46,800 feet of trail, to arrive at a figure of \$2.34 million to \$4.68 million. This would be for trail construction only, not including design, topographic survey, construction administration, testing, inspection, public review, and other costs such as CEQA/NEPA review. Additional construction line items such as new parking areas with attendant spur trails, interpretative signage, etc. would add to the cost.

PROJECT IMPLEMENTATION – FUTURE STEPS

Future steps will include preparation of environmental documentation, preliminary trail design, final design, and construction. Funding must be secured, and responsible lead agency(ies) identified to implement the project. Implementation may occur on a phased basis.

The precise trail routing will be established in the field. The alignment will be flagged by appropriate agency personnel, and the route may then be reviewed in the field, adjusted, and

approved. This process will be time consuming, with the results depending on the amount of time spent on the ground and thought given to creating the best alignment and user experience. Consideration should be given to achieving solitude, taking advantage of views, and the degree of physical challenge presented by the trail routing. Time spent exploring the terrain, sitting on rocks, and contemplating the trail user's experience will be well spent.

Permitting will be required from various regulatory agencies. Any work within the State right-of-way will require a Caltrans Encroachment Permit. The County may require a grading permit for trail construction, or a building permit for any structures such as bridges. The SFPUC is exempt from local planning and building requirements. Any impact to wetland or in-stream habitat would require consultation with and possible permitting from the State Department of Fish and Game, the San Francisco Bay Area Regional Water Quality Control Board and the U.S. Army Corps of Engineers. Analysis of the trail design on SFPUC lands for consistency with the Peninsula Watershed Management plan, the related FEIR and Americans with Disabilities Act will also be necessary. Other permits may be required as well.

Appendices

1. Biological Assessment
2. Guidelines for Planning and Implementing the Bay Area Ridge Trail System – Bay Area Ridge Trail Council
3. Trail Design Guidelines – Bay Area Ridge Trail Council
4. Excerpts from San Mateo County Trails Master Plan
5. Excerpts from Web Soil Survey, N.R.C.S.

Appendix I

Ridge Trail Feasibility Study Highway 92 to Huddart Park

Biological Assessment

Prepared for:

Harris Design
Attn: Bill Harris

Prepared by:

Biotic Resources Group
Kathleen Lyons, Plant Ecologist

With
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Dana Bland, Wildlife Biologist

December 10, 2007

RIDGE TRAIL FEASIBILITY STUDY HIGHWAY 92 TO HUDDART PARK

BIOLOGICAL ASSESSMENT

INTRODUCTION

The proposed Ridge Trail, Highway 92 to Huddart Park, project site is located within San Mateo County, California. The proposed trail will be located on the east side of Highway 35 in San Mateo County, extending from Highway 92 south to Huddart County Park. The trail will occur on public property owned by the San Francisco Public Utilities Commission (San Francisco Watershed), the National Park Service (Phleger Estate) and San Mateo County (Huddart County Park). The project area occurs within San Francisco Watershed Lands, the Phleger Estate, and Huddart Park. Portions of the proposed trail alignment abut private residences. The Kings Mountain CalFire Station is located near the mid-point of the proposed trail alignment. The trail is intended to be a multi use trail as defined by the Bay Area Ridge Trail council. Depending on topographic conditions, the trail is proposed to be four to six feet in width. It will be open to hikers, equestrians, and bicyclists.

Project Description

San Mateo County Parks Department proposes to construct a section of the multi-use Ridge Trail. The proposed trial section would connect to an existing parking/staging area at the intersection of Highways 92 and 35 and to public trails on the Phleger Estate and Huddart Park. The preliminary design for the trail has been prepared by Harris Design (*Ridge Trail Preliminary Design*, dated May 2007).

Biological Assessment

An assessment of the biotic resources of the proposed trail route area was conducted during a site survey in October 2007. Due to access limitations to the San Francisco Watershed lands and the preliminary nature of the proposed trail route, the focus of the field assessment was to identify general plant community types/habitat conditions within the overall project area and identify potential sensitive biotic resources within the project area that may be affected by the proposed trail development.

Specific tasks conducted for this study include:

- Characterize the major plant communities within the general project area;
- Identify potential sensitive biotic resources, including plant and wildlife species of concern, within the general project area;
- Evaluate the potential effects of the proposed trail on sensitive biotic resources and recommend measures to avoid or reduce such impacts.

Intended Use of this Report

The findings presented in this biological report are intended for the sole use of the Harris Design and San Mateo County Parks Department in evaluating the feasibility of the proposed trail alignment. The findings presented by the Biotic Resources Group in this report are for information and feasibility planning purposes only; they are not intended to represent the interpretation of any State, Federal or County laws or ordinances pertaining to permitting actions within sensitive habitat or endangered species. The interpretation of such laws and/or ordinances is the responsibility of the applicable governing body.

EXISTING BIOTIC RESOURCES

METHODOLOGY

The biotic resources of the proposed Ridge Trail, Highway 92 to Huddart Park, project area were assessed through field observations on October 5, 2007. A plant ecologist and a wildlife biologist viewed the general location of the trail alignment, as well as adjacent areas. Viewing was conducted from Highway 35 and other public access points along and adjacent to the proposed trail alignment. Since the trail alignment is preliminary and the route was not flagged or otherwise identified in the field at the time of the survey, the assessment is considered to be an evaluation of general site conditions within the project area.

To assess the potential occurrence of special status biotic resources within the general project area, two electronic databases were accessed to determine recorded occurrences of sensitive plant communities and sensitive species. Information was obtained from the California Native Plant Society's (CNPS) Electronic Inventory (2007) and California Department of Fish & Game's (CDFG) Natural Diversity DataBase "RareFind" (CNDDDB) (CDFG, 2007) for the project's U.S.G.S. quadrangle (Woodside) and the eight surrounding quadrangles: Montara Mountain, San Mateo, Palo Alto, Mindego Hill, Redwood Point, Half Moon Bay, San Gregorio, and La Honda.

Prior to conducting field surveys, a potential list of special status or sensitive species was prepared, utilizing species documented in the data base search. The *Jepson Manual* (Hickman, 1993) was the principal taxonomic references used for the botanical work.

This report summarizes the findings of the biotic assessment. The potential impacts of the proposed development of the multi-use trail on sensitive biological resources are discussed below. Measures to reduce significant impacts to a level of less-than-significant are recommended, as applicable.

EXISTING BIOTIC RESOURCES

Five principal plant community types were observed within the Ridge Trail project area: northern coastal scrub, Douglas fir forest, coast redwood forest, mixed evergreen forest and non-native tree groves. The project area also includes several ephemeral and intermittent drainages, which may support in-stream seasonal wetlands.

Northern Coastal Scrub

The northern portion of the trail alignment traverses coast scrub. This dense, brushy vegetation occupies windswept slopes and ridges along Highway 35 near the road's intersection with Highway 92. The vegetation is dominated by coyote brush (*Baccharis pilularis*) and poison oak (*Toxicodendron diversilobum*), with lesser amounts of coffee berry (*Rhamnus californica*), California blackberry (*Rubus ursinus*), and lizard tail (*Eriophyllum staechadifolium*). Other native plant species include mugwort (*Artemisia douglasiana*), ocean spray (*Holodiscus discolor*), blue blossom (*Ceanothus thrysiflorus*), dogwood (*Cornus sp.*) and toyon (*Heteromeles arbutifolia*). Herbaceous species are limited, however, open areas were observed to support purple needlegrass (*Nassella pulchra*), curly dock (*Rumex crispus*), and sword fern (*Polystichum munitum*).

Invasive, non-native plant species are also common to coastal scrub; these species were observed during the October 2007 field survey: poison hemlock (*Conium maculatum*), teasel (*Dipsacus sativus*), fennel (*Foeniculum vulgare*), pampas grass (*Cortaderia jubata*), bull thistle (*Cirsium vulgare*), French broom (*Genista monspessulana*) and acacia (*Acacia spp.*).

The scrub also supports scattered native and non-native trees and small tree groves. The trees include non-native Monterey cypress (*Cupressus macrocarpa*) and Monterey pine (*Pinus radiata*), as well as native Douglas fir (*Pseudotsuga menziesii*) and coast live oak (*Quercus agrifolia*).

The berries of shrubs and the seeds of herbaceous plants in the coastal scrub habitat provide important forage for wildlife. Wildlife may perch on the outer perimeter of mixed scrub to take advantage of hunting opportunities in adjacent openings, and take cover in the denser shrub patches as needed. Common wildlife species found in coastal scrub include western fence lizard, California towhee (*Pipilo crissalis*), white-crowned sparrow (*Zonotrichia leucophrys*), and coyote (*Canis latrans*).

Forest Communities

Three forest communities occur along the trail alignment: Douglas fir forest, mixed evergreen forest and redwood forest.

Douglas Fir and Mixed Evergreen Forests. The east side of Highway 35 supports forested areas dominated by Douglas fir. These evergreen conifers occupy moist slopes and wind-protected canyons in the northern portion of the trail project area, forming a transitional vegetation zone between the coastal scrub and the more prevalent redwood forest. Douglas fir provides over 80% of the tree cover, with low amounts of cover provided by hardwood species (i.e., oaks and madrone). The Douglas fir forest intergrades to a mixed evergreen forest on drier slopes and ridges along Highway 35. Hardwood tree species, such as tanoak (*Lithocarpus densiflorus*), coast live oak, madrone (*Arbutus menziesii*) co-dominate with Douglas fir in this forest types. Associated species include blue elderberry (*Sambucus mexicana*) and scattered occurrences of big leaf maple (*Acer macrophyllum*). The forest understory is diverse with shrubs and herbs, including small-flowered nightshade (*Solanum douglasii*), hazel nut (*Corylus cornuta*), wood fern (*Dryopteris arguta*), and California blackberry.

Acorns from oaks in the mixed evergreen forest habitat provide an important food resource for many wildlife species, and natural cavities in the oaks provide nesting opportunities for some birds and mammals. Snags are an important component of oak woodlands to some wildlife such as Acorn

woodpecker (*Melanerpes formicivorus*), which excavate nests in snags and holes for storing acorns. Downed decaying logs and limbs add to the structural complexity of the habitat, and are important cover, nesting, roosting, and foraging substrate for species such as arboreal salamander (*Aneides lugubris*) which are attracted to the moist microclimate and invertebrate food supply. The denser portions of the forest may also provide escape cover during the day for species such as deer (*Odocoileus hemionus*). Common wildlife species expected to occur in mixed evergreen forest along the project area include California slender salamander (*Batrachoseps attenuatus*), western fence lizard (*Sceloporus occidentalis*), scrub jay (*Aphelocoma coerulescens*), California quail (*Callipepla californica*), red-tailed hawk (*Buteo jamaicensis*), several species of bats, western gray squirrel (*Sciurus griseus*), and deer (*Odocoileus hemionus*).

Coast Redwood Forest. In the mid and southern portions of the trail alignment project area, the vegetation is dominated by coast redwood forest. Coast redwoods (*Sequoia sempervirens*) are the dominant tree species, yet the forest also supports Douglas fir, tanoak, madrone and lesser amounts of coast live oak. Large, old growth redwoods were noted on the San Francisco Watershed lands where these lands abut Purisima Creek Open Space Preserve. The redwood forest understory varies in species diversity and density depending on light penetration through the tree canopy. Shrub cover is dominated by huckleberry (*Vaccinium ovatum*), sword fern, hazel nut, thimbleberry (*Rubus parviflorus*), California blackberry, and California rose (*Rosa californica*). Common herbaceous plant species include yerba buena (*Satureja douglasii*), redwood sorrel (*Oxalis oregona*), yerba de selva (*Whipplea modesta*), hedge nettle (*Stachys bullata*), California milkwort (*Polygala californica*), pea (*Lathyrus sp.*), Douglas iris (*Iris douglasiana*), and wood strawberry (*Fragaria vesca*). Small, open grassy areas were observed; these areas support stands of California brome (*Bromus carinatus*) and blue wild rye (*Elymus glaucus*). Also observed were occurrences of wild oat (*Avena sp.*), rattlesnake grass (*Briza major*), filago (*Filago gallica*), small rattlesnake grass (*Briza minor*), soft chess (*Bromus hordeaceus*) and rattail fescue (*Vulpia myuros*).

The redwood forest has native understory plants with abundant fruit and seeds, such as elderberry and California hazelnut that provide forage for wildlife. The natural cavities in redwood forest trees provide opportunities for nesting by birds, cover for small mammals such as raccoons, and roosting by bats. The cool, damp microclimate of the redwoods attracts more amphibians than the drier climates of oak woodland. Common wildlife that may inhabit this forest include yellow-eyed salamander (*Ensatina eschscholtzi*), acorn woodpecker (*Melanerpes formicivorus*), Steller's jay (*Cyanocitta stelleri*), northern pygmy-owl (*Glaucidium gnoma*), and several species of bats.

Non-native Tree Groves

The project area supports several non-native tree groves. These groves are most prevalent along the northern portion of the trail project area. The trees occur as distinct stands amid otherwise coastal scrub dominated areas or as groves abutting the Douglas fir/mixed evergreen forested areas. The tree groves are comprised of Monterey cypress, Monterey pine, and blue gum eucalyptus (*Eucalyptus globulus*). Other non-native species were associated with the eucalyptus tree grove; periwinkle (*Vinca major*) and French broom were observed in and around this tree grove.

Eucalyptus is not native to California, and does not support a very diverse wildlife assemblage. Common wildlife species that utilize eucalyptus groves include alligator lizard (*Gerrhonotus multicarinatus*),

Anna's hummingbird (*Calypte anna*), and woodrat. Eucalyptus trees are locally important as they provide potential wintering habitat for monarch butterflies (*Danaus plexippus*). The large eucalyptus groves on the property also provide potential roosting and nesting habitat for raptors such as red-tailed hawk, red-shouldered hawk (*Buteo lineatus*) and great horned owl (*Bubo virginianus*).

Ephemeral and Intermittent Drainage Features

The project area is situated along the east side of Highway 35. Drainage from this side of the mountain range flows eastward toward Upper Crystal Springs Reservoir via numerous drainages. Adobe Gulch, a perennial drainage, is located at the northern end of the trail project area and several unnamed drainages traverse the slope of Kings Mountain. Since the trail alignment is preliminary and the route was not flagged or otherwise identified in the field at the time of the survey, the condition of potential drainage/creek crossing was not determined. It is likely that the more developed drainages (i.e., those with perennial flow) supports small amounts of in-stream wetland vegetation.

The drainages provide at least seasonal sources of drinking water for terrestrial wildlife, and may provide suitable habitat for aquatic species such as frogs where water forms pools. Where wetland vegetation is present, invertebrates are likely to be more abundant and provide important forage for birds and bats. Because we did not determine the conditions at sites where the trail will cross drainages, a detailed description of the wildlife habitat was not made for this report.

SENSITIVE BIOTIC RESOURCES

Sensitive Habitats

Sensitive habitats are defined by local, State, or Federal agencies as those habitats that support special status species, provide important habitat values for wildlife, represent areas of unusual or regionally restricted habitat types, and/or provide high biological diversity.

Within the project area in-stream wetlands (within creeks and drainages) are considered sensitive due to their importance to plant and animal species and are recognized as such by state and federal agencies. Habitats that support rare or endangered species are also considered sensitive.

Special Status Plant Species

Plant species of concern include those listed by either the Federal or State resource agencies as well as those identified as rare by CNPS. Based on a search of the CNPS and CNDDDB inventories for the Woodside and surrounding quadrangles and a review of pertinent literature, several special status plant species have the potential to occur in the project vicinity (see Table 1). Two special status plant species, Santa Cruz manzanita and Kings Mountain manzanita, have been recorded within the immediate vicinity of the project area. Western leatherwood has been recorded from slopes abutting upper Crystal Springs Reservoir. Scrub and mixed evergreen forest communities within project area have the potential to support these species are highlighted on Table 1.

No special status plant species were observed in the general project area during the October 2007 surveys; however, these surveys were preliminary considering the actual trail route was not marked or surveyed. The October assessment was also conducted outside of the typical plant-flowering season, such that the survey cannot fully conclude presence or absence of special status species from the project area. The project area has not been documented to support serpentine-derived soils, as such the potential occurrence of serpentine endemic plant species is considered low.

Table 1. List of Special Status Plant Species Evaluated for Occurrence within the Ridge Trail, Highway 92 to Huddart Park Project Area, San Mateo County

| Species | Status | Habitat | Known Occurrence on Site/Vicinity Potential Habitat within Project Area? |
|--|---|---|---|
| Woodside Quadrangle | | | |
| San Mateo Thornmint (<i>Acanthomintha duttonii</i>) | CNPS: List 1B.1 State: E Federal: E | Serpentine grasslands (moist areas) | Not observed on site yet known from the Edgewood Park area. Low potential on site due to lack of serpentine habitat. |
| Franciscan Onion (<i>Allium peninsulare</i> var. <i>franciscanum</i>) | CNPS: List 1B.2 State: None Federal: None | Woodland, grassland on serpentine | Not observed on site yet known from the Jasper Ridge, Stanford area and Crystal Springs area (1903 collections) Low potential on site due to lack of serpentine habitat. |
| Santa Cruz Manzanita <i>Arctostaphylos andersonii</i> | CNPS: List 1B.2 State: None Federal: None | Chaparral, coniferous forests; open sites in redwood forest | Recorded from Highway 35 in project vicinity (1936 and 1974) Moderate potential within project area depending upon exact trail alignment. |
| Kings Mountain Manzanita <i>Arctostaphylos regismontana</i> | CNPS: List 1B.2 State: None Federal: None | Chaparral, coniferous forests; granitic or sandstone outcrops | Recorded from Highway 35 in project vicinity (1930 and 1936); along Kings Mountain Road (1997) in chaparral; Teague Hill OS (1994) in oak woodland. High potential within project area depending upon exact trail alignment. |
| Coastal Marsh Milk Vetch <i>Astragalus pycnostachyus</i> var. <i>pycnostrachyus</i> | CNPS: List 1B.2 State: None Federal: None | Coastal dunes, coastal salt marshes; mesic sites | Recorded from Crystal Springs Reservoir (unknown date). Low potential within project area due to lack of coastal marsh or dune habitat. |
| Fountain Thistle (<i>Cirsium fontinale</i> var. <i>fontinale</i>) | CNPS: List 1B.1 State: E Federal: E | Serpentine grassland with moist conditions (seep) | Recorded from Edgewood Park in serpentine grassland seeps. Low potential on site due of lack of serpentine seep habitat. |
| San Francisco Collinsia (<i>Collinsia multicolor</i>) | CNPS: List 1B.2 State: E Federal: E | Coastal scrub and pine forests; decomposed shale/mudstone | Recorded from Edgewood Park in foothill woodland. Moderate potential within project area depending upon trail alignment within coastal scrub. |
| Western Leatherwood | CNPS: List 1B.2 | Upland forest, | Recorded from Crystal Springs Lake and La |

| Species | Status | Habitat | Known Occurrence on Site/Vicinity Potential Habitat within Project Area? |
|---|--|---|---|
| <i>(Dirca occidentalis)</i> | State: None Federal: None | chaparral and redwood riparian woodlands | Honda Preserve in shady most woods and redwood riparian areas. High potential within project area depending upon trail alignment and creek crossings. |
| Fragrant Fritillary <i>(Fritillaria liliacea)</i> | CNPS: List 1B.2 State: None Federal: None | Serpentine chaparral, scrub and grassland | Recorded from Edgewood Park area. Low potential on site due to lack of serpentine habitat. |
| Marin western flax <i>(Hesperolinum congestum)</i> | CNPS: List 1B.1 State: T Federal: T | Serpentine grasslands, open areas, chaparral | Recorded from Edgewood Park area, Woodside Glen and NE of Canada College. Low potential on site due to lack of serpentine habitat. |
| Crystal Springs Lessingia <i>(Lessingia arachnoidea)</i> | CNPS: List 1B.2 State: None Federal: None | Serpentine coastal scrub and grassland | Known from Edgewood Park. Low potential on site due to lack of serpentine habitat. |
| Woolly-headed Lessingia <i>(Lessingia hololeuca)</i> | CNPS: List 3 State: None Federal: None | Sandy soils in remnant dunes and coastal scrub | Known from San Bruno Mtn. and Presidio in San Francisco. Moderate potential within project area depending upon trail alignment within coastal scrub. |
| San Mateo Tree Lupine <i>(Lupinus eximius)</i> | CNPS: List 3.2 State: None Federal: None | Coastal scrub and coastal bluffs | Known from coastal San Mateo County. Moderate potential within project area depending upon trail alignment within coastal scrub. |
| Arcuate Bush Mallow <i>(Malacothamnus acuatus)</i> | CNPS: List 1.B.2 State: None Federal: None | Chaparral, on gravelly alluvium | Known from Edgewood Park and south of Pulgas Creek. Moderate potential to occur within project area depending upon trail alignment and presence of patches of chaparral. |
| Davidson's Bush Mallow <i>(Malacothamnus davidsonii)</i> | CNPS: List 1.B.2 State: None Federal: None | Coastal scrub, chaparral and sandy washes | Herbarium record from Belmont (1901). Potential within project area depending upon trail alignment and presence of patches of sandy coastal scrub. |
| Dudley's Lousewort <i>(Pedicularis dudleyi)</i> | CNPS: List 1.B.2 State: None Federal: None | Conifer forest; deep woods in old growth redwoods | Known from Portola State Park. Moderate potential within project area depending upon trail alignment in redwood forest. |
| White-rayed Pentachaeta <i>(Pentachaeta bellidiflora)</i> | CNPS: List 1B State: E Federal: E | Rocky slopes in serpentine grassland | Recorded from triangle area near Edgewood Park and Crystal Springs. Low potential on site due to lack of serpentine habitat. |
| Choris' Popcorn Flower <i>(Plagiobothrys chorisianus var. chorisianus)</i> | CNPS: List 1B.2 State: None Federal: None | Chaparral, coastal scrub and coast prairie, mesic sites | Recorded from Old Canada Road, Upper Springs Reservoir. Moderate potential to occur within project area depending upon trail alignment and presence of |

| Species | Status | Habitat | Known Occurrence on Site/Vicinity Potential Habitat within Project Area? |
|---|---|---|---|
| | | | patches of mesic areas. |
| San Francisco Campion (<i>Silene verecunda</i> ssp. <i>verecunda</i>) | CNPS: List 1B.2 State: None Federal: None | Coastal scrub, grassland, chaparral and grassland; on mudstone and serpentine | Recorded from Edgewood Park in serpentine grassland. Moderate potential to occur within project area depending upon trail alignment and presence of patches of mudstone outcrops in coastal scrub. |
| Surrounding Quadrangles (Montara Mountain, San Mateo, Palo Alto, Mindogo Hill, Redwood Point, Half Moon Bay, San Gregorio, La Honda) | | | |
| Bent-flowered Fiddleneck (<i>Amsinckia lunaris</i>) | CNPS: List 1B.2 State: None Federal: None | Oak woodland and grassland | Recorded from Crystal Springs Road and Tartan Trail. Low potential on site due of lack of suitable habitat. |
| Montara Manzanita (<i>Arctostaphylos montaraensis</i>) | CNPS: List 1B State: None Federal: None | Maritime chaparral and coastal scrub on decomposed granite soils | Known from San Bruno and Montara Mountain. Low potential on site due of lack of suitable habitat. |
| Round-leaved Filaree (<i>Geranium [California] macrophyllum</i>) | CNPS: List 1B.1 State: None Federal: None | Oak woodland and Grassland | Recorded from Pescadero (1896). Low potential on site due of lack of suitable habitat. |
| Congdon's Tarplant (<i>Centromadia parryi</i> ssp. <i>congdonii</i>) | CNPS: List 1B.2 State: None Federal: None | Alkali grasslands, clay soils | Historically known from Menlo Park. Low potential on site due of lack of suitable habitat. |
| Pappose Tarplant (<i>Centromadia parryi</i> ssp. <i>parryi</i>) | CNPS: List 1B.2 State: None Federal: None | Coastal prairie, seeps in grassland | Recorded from Rockaway Beach area, north side of Highway 1. Low potential on site due of lack of suitable habitat. |
| San Francisco Bay Spineflower (<i>Chorizanthe cuspidata</i> var. <i>cuspidata</i>) | CNPS: List 1B.2 State: None Federal: None | Coastal bluffs and coastal prairie | Herbarium collection near junction of Hwy 280 and 92. Low potential on site due of lack of suitable habitat. |
| Franciscan Thistle (<i>Cirsium andrewsii</i>) | CNPS: List 1B.2 State: None Federal: None | Coastal bluffs and coastal prairie; wet seeps | Recorded from San Pedro Point area. Low potential on site due of lack of suitable habitat. |
| Lost Thistle (<i>Cirsium praeteriens</i>) | CNPS: List 1A State: None Federal: None | Unknown | Herbarium record from Palo Alto (1901) Possibly extinct. |
| Point Reyes Bird's Beak (<i>Cordylanthus maritimus</i> ssp. <i>palustris</i>) | CNPS: List 1B.2 State: None Federal: None | Coastal salt marsh | Recorded from Belmont salt marshes. Low potential on site due of lack of suitable habitat. |
| Tiburon Buckwheat | CNPS: List 1B.2 | Chaparral and | Recorded from Marin and Alameda Counties |

| Species | Status | Habitat | Known Occurrence on Site/Vicinity Potential Habitat within Project Area? |
|---|---|---|---|
| <i>(Eriogonum luteolum var. caninum)</i> | State: None Federal: None | grassland, serpentine | Low potential on site due of lack of suitable habitat. |
| Ben Lomond Buckwheat <i>(Eriogonum nudum var. decurrens)</i> | CNPS: List 1B.1 State: None Federal: None | Chaparral on Zayante sand hill deposits | Ben Lomond, Felton region Low potential on site due of lack of suitable habitat. |
| San Mateo Woolly Sunflower <i>(Eriophyllum latilobum)</i> | CNPS: List 1B.1 State: None Federal: None | Coastal scrub and pine forests; serpentine | Known from Crystal Springs Road. Low potential due to lack of suitable habitat. |
| Hoover's Button Celery <i>(Eryngium aristulatum var. hooveri)</i> | CNPS: List 1B.1 State: None Federal: None | Vernal pools | Recorded from foothills near Stanford. Low potential on site due of lack of suitable habitat. |
| Hillsborough Chocolate Lily <i>(Fritillaria biflora var. ineziana)</i> | CNPS: List 1B.1 State: None Federal: None | Woodland, grassland on serpentine | Not observed on site yet known from the Hillsborough and Buri Buri Ridge area. Low potential on site due of lack of suitable serpentine habitat. |
| San Francisco Gumplant <i>(Grindelia hirsutula var. maritima)</i> | CNPS: List 1B.2 State: None Federal: None | Coastal scrub and coastal bluffs | Not observed on site yet known from the Hillsborough and Buri Buri Ridge area. Low potential on site due of lack of suitable serpentine habitat. |
| Short-leaved Evax <i>(Hespererevax sparsiflora var. brevifolia)</i> | CNPS: List 2.2 State: None Federal: None | Coastal bluff, scrub, dunes | Recorded from Jamison Creek Road near Big Basin (1950- erroneous?). Low potential on site due of lack of suitable habitat. |
| Kellogg's Horkelia <i>(Horkelia cuneata ssp. sericea)</i> | CNPS: List 1B.1 State: None Federal: None | Coastal sandhills, remnant dunes, coastal scrub | Recorded from San Bruno Mtn. Low potential on site due of lack of suitable sandy habitat. |
| Point Reyes Horkelia <i>(Horkelia marinensis)</i> | CNPS: List 1B.2 State: None Federal: None | Sandy coastal flats, prairie dune and scrub | Recorded from Junipero Serra Peak. Low potential on site due of lack of suitable sandy habitat. |
| Legenere <i>(Legenere limosa)</i> | CNPS: List 1B.1 State: None Federal: None | Wet areas, vernal pools, seasonal ponds | Historic records in greater region Low potential on site due of lack of suitable habitat. |
| Coast Yellow Leptosiphon <i>(Leptosiphon croceus)</i> | CNPS: List 1B.1 State: None Federal: None | Coastal bluff and prairie | Recorded from Vallemar bluff, Moss Beach. Low potential on site due of lack of suitable habitat. |
| Rose Leptosiphon <i>(Leptosiphon rosaceus)</i> | CNPS: List 1B.1 State: None Federal: None | Coastal bluff and scrub | Recorded from Moss Beach and Mori Point. Low potential on site due of lack of suitable habitat. |
| Coast Lily <i>(Lilium maritimum)</i> | CNPS: List 1B.1 State: None | Bogs, gaps in pine forests, coastal | Recorded from Sonoma and Mendocino Counties. |

| Species | Status | Habitat | Known Occurrence on Site/Vicinity Potential Habitat within Project Area? |
|---|--|---|--|
| | Federal: None | prairie and scrub | Low potential on site due of lack of suitable wet habitat. |
| Hall's Bush Mallow (<i>Malacothamnus hallii</i>) | CNPS: List 1.B.2 State: None Federal: None | Chaparral, on serpentine | Known from Belmont area Low potential to occur within project area due to lack of serpentine chaparral. |
| Cottonweed (<i>Micropus amphibolus</i>) | CNPS: List 3.2 State: None Federal: None | Grassland, oak woodland; open rocky areas | No records in region. Low potential. |
| Marsh Microseris (<i>Microseris paludosa</i>) | CNPS: List 1B.2 State: None Federal: None | Pine forests, coastal scrub and grassland | Known from Pebble Beach and Pescadero area. Moderate potential to occur within project area depending upon trail alignment and presence of patches of coastal scrub. |
| Robust Monardella (<i>Monardella villosa ssp. globosa</i>) | CNPS: List 1B.2 State: None Federal: None | Openings in oak woodland and chaparral | Known from Coal Mine Ridge (1937). Moderate potential to occur within project area depending upon trail alignment |
| White-flowered Rein Orchid (<i>Piperia candida</i>) | CNPS: List 1B.2 State: None Federal: None | Shaded areas in conifer and mixed evergreen forests; rock outcrops | Known from Big Basin Redwoods SP and Los Trancos OP, Portola SP. Moderate potential to occur within project area depending upon trail alignment through forested areas. |
| Slender-leaved Pondweed (<i>Potamogeton filiformis</i>) | CNPS: List 2.2 State: None Federal: None | Shallow freshwater marshes and ponds | Known Palo Altos (1899). Low potential to occur within project area due to lack of suitable habitat. |
| Hickman's Cinquefoil (<i>Potentilla hickmanii</i>) | CNPS: List 1B.1 State: None Federal: None | Coastal scrub, prairie, marshy areas | Known from Moss beach, Devils Slide area. Low potential to occur within project area due to lack of suitable habitat. |

CNPS Status:

List 1B: These plants (predominately endemic) are rare through their range and are currently vulnerable or have a high potential for vulnerability due to limited or threatened habitat, few individuals per population, or a limited number of populations. List 1B plants meet the definitions of Section 1901, Chapter 10 of the CDFG Code.

List 2: Considered rare in California, but common elsewhere.

List 3: This is a review list of plants that lack sufficient data to assign them to another list.

Federal and State Status:

T: Designated as a threatened species by the federal government or the California Fish and Game Commission

E: Designated as an endangered species by the federal government or the California Fish and Game Commission

Special Status Wildlife Species

Special status wildlife species include those listed, proposed or candidate species by either the Federal or the State resource agencies as well as those identified as State species of special concern. In addition, all raptor nests are protected by Fish and Game Code, and all migratory bird nests are protected by the Federal Migratory Bird Treaty Act. Special status wildlife species were evaluated for their potential presence in the project area as described in Table 2 below.

Table 2. Special Status Wildlife Species and Their Predicted Occurrence along the Ridge Trail Project Site, San Mateo County, December 2007.

| SPECIES | STATUS ¹ | HABITAT | POTENTIAL OCCURRENCE ON SITE |
|--|---------------------|--|---|
| Invertebrates | | | |
| Bay checkerspot butterfly <i>Euphydryas editha bayensis</i> | FE | Grasslands with larval host plant <i>Sedum spathulifolium</i> | None. No suitable habitat on site. |
| Fish | | | |
| Steelhead <i>Oncorhynchus mykiss</i> | FT, CSC | Perennial creeks and rivers with gravels for spawning. | None. No suitable habitat on site. |
| Amphibians | | | |
| California tiger salamander <i>Ambystoma californiense</i> | FT, CSC | Ponds for breeding, grasslands with burrows for upland habitat | None, no suitable habitat on site. |
| California red-legged frog <i>Rana aurora draytonii</i> | FT, CSC | Riparian, marshes, estuaries and ponds with still water at least into June for breeding. | Possible where trail crosses drainages; known from Albert Canyon Creek to west and portions of Upper Crystal Springs Reservoir to east. |
| Reptiles | | | |
| Southwestern pond turtle <i>Clemmys marmorata pallida</i> | CSC | Creeks and ponds with water of sufficient depth for escape cover, and structure for basking; grasslands or bare areas for nesting. | Unlikely; no suitable ponds or perennial streams on site. |
| San Francisco garter snake <i>Thamnophis sirtalis tetrataenia</i> | FE, SE | Creeks and ponds with adjacent open grasslands for upland refugia | None, no suitable habitat on site. |
| Birds | | | |
| Sharp-shinned hawk <i>Accipiter striatus</i> | CSC | Nests in coniferous forests; forages on smaller birds. | May nest in coniferous woodlands on site. |
| Cooper's hawk <i>Accipiter cooperii</i> | CSC | Nests in oak woodland or riparian woodland; forages widely | May nest in woodlands on site. |
| Merlin <i>Falco columbarius</i> | CSC | Winters in a variety of habitats; feeds on smaller birds; does not nest in California | May winter in woodland habitats on site. |
| Vaux's swift <i>Chaetura vauxi</i> | CSC | Nest in hollow of old growth or mature second growth redwood and Douglas fir trees | May nest in trees with suitable hollows on site. |
| Loggerhead shrike <i>Lanius ludovicianus</i> | CSC | Nests in shrub habitat with surrounding grasslands or open areas for foraging | May nest in scrub habitats. |
| Saltmarsh common yellowthroat <i>Geothlypis trichas sinuosa</i> | CSC | Nests in dense vegetation at water's edge of ponds, estuaries, creeks | None, no suitable habitat on site. |
| Tricolored blackbird <i>Agelaius tricolor</i> | CSC | Dense bulrush and/or cattail vegetation adjacent to | None, no suitable habitat on site. |

| SPECIES | STATUS ¹ | HABITAT | POTENTIAL OCCURRENCE ON SITE |
|---|---------------------|--|---|
| | | freshwater marshes | |
| Mammals | | | |
| Pallid bat <i>Antrozous pallidus</i> | CSC | Roosts in rock outcroppings, caves, hollow trees, mines, buildings and bridges. | Possible if trees with suitable roosting hollows are present. |
| Western red bat <i>Lasiurus blossevillii</i> | CSC | Roosts in tree foliage, often at woodland edges; known to utilize cottonwood and willow, may use others. | Possible if suitable roosting trees are present. |
| Hoary bat <i>Lasiurus cinereus</i> | CSC | Roosts in dense foliage of deciduous and coniferous trees in a variety of woodland habitat types. | May occur in woodlands on site. |
| San Francisco dusky-footed woodrat <i>Neotoma fuscipes annectens</i> | CSC | Oak, pine and riparian woodlands | May occur in woodlands on site. |

¹ Key to status:

- FE = Federally listed as endangered species
- FT = Federally listed as threatened species
- SE = State listed as endangered species
- CSC = California species of special concern

FEASIBILITY STUDY RECOMMENDATIONS

POTENTIAL IMPACTS

For this feasibility study analysis, significant impacts are those that substantially affect either:

- A species (or its habitat) listed or proposed for listing by State or Federal governments as rare or endangered;
- Breeding/nesting habitat for a State species of special concern;
- A plant considered rare (i.e., List 1B) by CNPS;
- A habitat regulated by State or Federal law (i.e., in-stream wetlands,);
- Nesting birds regulated under the Federal Migratory Bird Treaty Act or Section 3503.5 of CDFG Code (i.e., nesting raptors), or
- A habitat or resource recognized as sensitive by the County of San Mateo (i.e., rare and endangered species habitat).

RECOMMENDATIONS TO MINIMIZE AND AVOID IMPACTS TO SENSITIVE RESOURCES

- Trail construction will require the removal of vegetation within the coastal scrub, Douglas fir/mixed evergreen forest and redwood forest, including removal of native shrubs (e.g., poison oak, coyote brush) and groundcovers (e.g., purple needlegrass, wild rye). Due to the prevalence of these species in the region, the removal of a small amount of this vegetation for the trail is not considered a significant impact to botanical resources.
- Development of the trail should avoid and/or minimize disturbances to mature native trees, to the greatest extent feasible. The trail would be constructed within the dripline of trunks of several oak, fir and redwood trees. Soil disturbances, particularly cut and fill, within close proximity of the tree trunk may damage tree roots and/or the tree trunk. Injuries to oak trees may cause the tree stress, which may make the tree susceptible to infestation from pathogens, such as the pathogen associated with Sudden Oak Death (SOD). Although no evidence of SOD was observed along the proposed trail route during the field survey, future visitors may transport the pathogen into the area. Significant injury to native trees that may result in the infestation of SOD into the area is a significant adverse impact.
- During trail construction, side cast materials shall not be deposited against the trunks of retained trees. During trail layout, all efforts shall be employed to retain a 5-foot setback from tree trunks and to retain all trees greater than 6 inches in diameter (measured at breast height); limbing may be required for some trees to achieve trail clearance requirements.
- Trail construction will occur in areas with the potential to support special status plant species. Prior to trail construction, the flagged trail route should be surveyed by a qualified botanist to ascertain the presence /absence of special status plant species deemed to have potential to occur within the project area. The survey should be conducted at the proper time of year for plant identification. If special status plant species are found along the route, the County shall either: 1) re-route the trail to avoid direct and indirect impacts to the species, or 2) minimize trail

construction activities within vicinity of species and demarcate the work area with temporary construction fencing to avoid inadvertent impacts to the nearby species.

- ☑ Once trail construction is complete the areas disturbed during construction should be seeded with locally obtained California brome (*Bromus carinatus*) and wild rye (*Elymus glaucus*).
- ☑ Occurrences of invasive, non-native plant species should be removed/controlled from the immediate trail area. Plant species of high priority for control include teasel, pampas grass, French broom, poison hemlock, and fennel.
- ☑ Implement measures to avoid or minimize impacts to drainage channels and in-stream wetlands and to prevent indirect impacts to the creek, adjacent watercourses and wetlands during trail construction. These measures include:
 - Implement erosion control measures during and following construction to avoid deposition of sediment into adjacent wetland and watercourses. Measures should include installation and maintenance of perimeter silt fencing or hay bales and post-construction erosion control seeding.
 - Utilize native plant species in the revegetation of disturbed areas.
 - Activities within the bed and bank of the intermittent and perennial watercourses may be subject to permitting under Section 404 of the Clean Water Act and Section 1601 of the Fish and Game Code. The project applicant may need to obtain a Section 404 permit and a Streambed Alteration Agreement prior to construction.
 - Vegetation adjacent to the construction work areas should be protected from inadvertent construction impacts by the placement of construction mesh fencing. The fencing will be in place prior to construction operations/grading at the sites.
- ☑ Schedule tree removal and construction to take place between August 1 and February 1, outside the breeding season of birds; OR Have a qualified biologist conduct pre-construction surveys no more than 30 days prior to construction to determine if sensitive bird species are nesting within or nearby the construction areas. If sensitive bird species are nesting in this area, the biologist shall determine a suitable buffer zone, and construction within the buffer zone shall be postponed until all young are fledged, as determined by a qualified biologist.
- ☑ Preliminary assessment of trees for potential bat roosts shall be conducted by the bat ecologist the year prior to anticipated tree removal, and if possible, minor reroutes of the trail should be incorporated to save trees identified as valuable bat roosts. No more than 30 days prior to the removal of any trees, a qualified bat ecologist shall survey the route to determine if sensitive bat species are roosting in any of the trees scheduled for removal. The bat biologist shall obtain an MOU with CDFG for the removal or exclusion of bats from the trees prior to their removal.
- ☑ An assessment of proposed trail crossings over drainages shall be made by a qualified biologist early in the project planning stages to determine if suitable habitat for the California red-legged frog is present. If such habitat is present, the biologist shall recommend avoidance and minimization measures to prevent or reduce potential impacts to the species, including but not limited to possible minor trail reroutes to avoid sensitive frog habitat. If potential impacts cannot

be avoided, the applicant shall consult with the U. S. Fish and Wildlife Service to obtain an incidental take permit for this federally listed species.

- ☑ Have a qualified biologist survey the work area for woodrat nests prior to any clearing of vegetation. If woodrat nests are present, consult with CDFG regarding the possibility of relocating the nests outside the work area, or other measures to reduce impacts to individuals.

LITERATURE CITED AND REFERENCES

- California Native Plant Society, 2007. Electronic Inventory of Rare and Endangered Plants of California. Electronic Data Base, 2007 edition.
- California, State of, Department of Fish & Game. 2007. Designated Endangered, Threatened or Rare Plants and Candidates with Official Listing Dates.
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Appendix 2

GUIDELINES FOR PLANNING AND IMPLEMENTING THE BAY AREA RIDGE TRAIL SYSTEM

Prepared by: Bay Area Ridge Trail Council

The following planning criteria were developed to guide planning and implementation of the Bay Area Ridge Trail System, comprising the Bay Area Ridge Trail ("Ridge Trail") and Bay Area Ridge Trail Connector Trails ("Connector Trails"), in accordance with goals and policies of the Bay Area Ridge Trail Council ("BARTC"). This document incorporates the BARTC Multi-use Policy as revised in December 1998.

County Committees are responsible for initiating trail designation recommendations for review and approval by the BARTC Trail Committee and Board of Directors. County Committees should work with local, regional, state and federal agencies, land owners, and land trusts with jurisdiction over the lands through which the trail passes. Alignments for sections to be dedicated are to be approved by the land-managing entity and/or land owner, the County Committee, and the BARTC Board of Directors (or its Executive Committee) with the recommendation of the Trail Committee. Participation in planning and trail dedication events by all affected jurisdictions should be encouraged.

Unless otherwise noted, each criterion applies both to the Ridge Trail and to Connector Trails. Unless marked "Required", each criterion expresses a desired but not firmly-required characteristic of each trail segment.

Trail Planning Goals and Guidelines

BARTC's goal is to create a multi-use ridgeline trail around San Francisco Bay connecting Bay Area parks and open space, and to create Connector Trails to facilitate access to the Bay Area Ridge Trail and to provide direct connections to communities and linkages to other major regional and long distance trails.

1. The Ridge Trail is located within the Ridge Trail corridor approved by BARTC. (This criterion does not apply to Connector Trails.)
2. The Ridge Trail is located on or near the principal ridgeline closest to San Francisco and San Pablo Bays and affords Bay views. (This criterion does not apply to Connector Trails.)
3. The Ridge Trail highlights natural, scenic, cultural and historic features. (This

criterion does not apply to Connector Trails.)

4. A Connector Trail connects the Ridge Trail with a trailhead in one or more communities or with overnight facilities, trails, natural, scenic, cultural and historic features, or open space areas not along the main Ridge Trail route. (This criterion applies only to Connector Trails.)
5. The trail alignment incorporates and connects trails within existing and proposed parks and open spaces, and provides links to communities, community trail networks, and regional and long-distance trail systems.
6. The trail is incorporated into local, regional, state and federal plans.
7. General plan amendments and other such actions proposed on behalf of BARTC are approved by BARTC's Board or its designated committee.

Promote land stewardship in a way that cultivates appreciation and protection of the Bay Area's parks, open spaces and natural resources.

1. The trail will be located, designed, constructed, and maintained in a manner intended to provide for reasonable control of erosion and other trail surface damage; appreciation and protection of water resources and of plant and animal communities, including protected species; and reasonable control of fire danger, according to standards provided by experts in those fields that may be consulted by BARTC.

Establish a trail system that is accessible to hikers, mountain bicyclists, and equestrians.

1. The trail accommodates hikers, mountain bicyclists and equestrians along a single alignment, and such multi-use segments will receive priority for dedication.
2. The trail has convenient access points (public transit, staging areas) for Bay Area communities.
3. The trail is adjacent to or near facilities such as litter disposal, telephone, water, restrooms, and camping areas or other overnight accommodations.
4. Where a Ridge Trail segment must incorporate separate parallel alignments to support all trail users, those separate alignments converge at both ends so all users have a designated continuous trail. (This criterion does not apply to Connector Trails.)
5. The trail is reasonably safe for use by all users. (Required.)
6. The trail is not on an alignment that is accessible to the public in motor vehicles.
7. The trail has a natural surface appropriate to the location but may have an adjacent paved surface to facilitate some users.

Develop a model public-private partnership to create a trail system connecting urban, suburban, and undeveloped areas.

1. The trail has a managing entity that has formally agreed to the presence of the trail and has formally accepted responsibility. (Required.)
2. The trail is developed and maintained in a cost-efficient manner.
3. The trail is supported by local citizens and all agencies with jurisdiction.
4. The trail is consistent with local and regional planning priorities.
5. The trail provides a continuous path of travel for hikers, mountain bicyclists and equestrians.
6. The route is signed with logo signs, including trailhead signs, trail markers, road crossings and safety signs as identified on a Sign Plan developed for the section.
7. Connector Trails are provided, connecting the Ridge Trail to Bay Area communities and to other trail systems at locations and intervals chosen to facilitate access to the Ridge Trail.

Appendix 3

TRAIL DESIGN GUIDELINES – BAY AREA RIDGE TRAIL COUNCIL

Trail Design and Construction

Recommended trail construction guidelines are shown in the table below. Although trail design criteria are usually determined by the managing entity, BARTC encourages that entity to meet or exceed these standards where feasible.

The *narrow-trail guideline* applies to lengths of trail where expected low use, topography, sensitive habitat, easements, or other restrictions limit trail width. Where possible, the *wide-trail guideline* should be used. In considering and applying these guidelines to trail engineering, implementation personnel should give the highest importance to the safety of trail users. BARTC may confer with experts in trail construction as it evaluates trail construction planning and implementation. Although the trail is generally designed for moderate physical challenge, some trails in areas with difficult terrain may be physically challenging.

| ITEM | WIDE-TRAIL GUIDELINE | NARROW-TRAIL GUIDELINE |
|---|--|------------------------|
| Minimum / Maximum tread width | 4 feet / none | 18 inches / 30 inches |
| Minimum clearing width each side of trail | 1 foot | 1 foot |
| Minimum clearing height | 9 feet | 9 feet |
| Maximum sustained grade | 10% | 15% |
| Max. grade for no more than 500 feet | 15% | 25% |
| Minimum inside radius for switchbacks | 5 feet | 3 feet |
| Minimum cross slope | 2% | 2% |
| Water control | appropriate techniques for the circumstances | |
| Surface | appropriate for the location | |

Trail Signage

1. Signs will be produced centrally by BARTC and distributed to the County Committees and managing entities as needed upon receipt of a Sign Plan that is in conformity with BARTC Trail Signage Policy and that is approved by the managing entity. The Sign Plan should indicate the type and proposed location of each sign.
2. Signs and signposts should be installed and maintained by or with the guidance and assistance of the managing entity. Replacements for lost, damaged or weathered signs will be produced by BARTC.
3. Signs should be paid for by the managing entity or with funds raised by the County Committee. If funding is not available from these sources, the County Committee should make a funding request to BARTC.
4. Signs are to be used as identification of the Ridge Trail or to direct trail users to the Ridge Trail along a Connector Trail or other public route.
5. Signs should be located at trailheads, access points, and junctions with other trails and at street corners, where appropriate, to guide trail users.
6. The County Committee should assess the adequacy of the signage prior to dedication, and on a regular basis thereafter, by on-site physical inspection. The County Committee should notify the entity managing the trail of any deficiencies in signage.

Trail Maintenance

In order to assure a high quality experience for trail users and to minimize adverse impacts on resources and facilities, BARTC encourages the managing entity to implement the following maintenance guidelines.

1. The trail should be maintained clear of brush, branches and litter.
2. Trail surface damage should be promptly repaired.
3. Appropriate techniques should be used and maintained to minimize erosion, other trail surface damage, and maintenance cost and time.
4. Where support facilities such as parking, restrooms, drinking water, and trash receptacles exist, they should be maintained in working order and in a condition suitable to supplying the services intended.
5. Trail segments providing for access by persons with physical disabilities should have facilities and trail standards adequate for this use maintained in accordance with applicable regulations.

6. Logo and directional signs, including trailhead signs and trail markers, should be installed and maintained as identified on a Sign Plan developed for the section in conformity with BARTC Trail Signage Policy, confirmed as necessary by on-site physical inspection by the County Committee.
7. Safety signs for connections along road shoulders and across roads should be installed and maintained.

Appendix 4

SAN MATEO COUNTY TRAILS PLAN

EXCERPTS FROM CHAPTER 4, COUNTY TRAILS DESIGN AND
MANAGEMENT GUIDELINES

D.G. 1.13 Areas of Geologic Instability

D.G. 1.13.1 Hazards. Appropriate surveys shall be conducted as part of trail route site planning to identify the occurrence of any potentially hazardous geologic conditions. Such areas shall be avoided or necessary construction design measures shall be incorporated into the design of the trail to assure that:

- Users will not be exposed to the identified hazard
- Trails would not contribute to increasing the degree or extent of instability
- Drainage from the trail would be routed away from the instability

D.G. 1.13.2 Sand Dunes. The proposed trails shall be designed to protect the integrity of sand dunes by routing trails around them instead of through them, whenever possible.

D.G. 1.13.3 Structures. Where structures are proposed, a geotechnical evaluation shall be conducted to identify engineering methods to reduce the potential for structural failure due to geological hazards

D.G. 1.14 Emergency Access

During trail implementation, planners should locate final trail alignments and access points to allow the trails to also serve as emergency access routes (for patrol or emergency medical transport). For more remote trails, emergency access points should be located, where feasible, approximately every two miles along the trail and provide either access for ground vehicles or helicopter landing sites.

D.G. 2.0 TRAIL SETTING

The public lands or easements that comprise the trail setting should provide width sufficient for management and/or buffer space from adjacent uses so as not to preclude the viability of those uses. Trail width shall be appropriate to the slopes that the trail transverses.

D.G. 2.1 Tread Width

D.G. 2.1.1 Tread. Trail tread width should be determined by amount and intensity of trail use and field conditions such as topography, vegetation and sensitivity of environmental resources.

D.G. 2.1.2 Multi-Use. Multiple-use, natural tread, double track trails should be designed as two-way paths. Where paved, the paved portions of a multiple-use trail should have an optimum width of 12 feet with a center stripe and minimal 2-foot, flush gravel shoulders, or clear space on each side of the trail.

D.G. 2.1.3 Hike Only. Single-purpose hiking trail treads should be an optimum of 4 feet wide.

D.G. 2.2 Trail Grades

Grades along trail treads should be held to a minimum. Grades of 10% or less are desirable; grades may be as great as but not greater than 12.5% without use of switchbacks. Where grades are steeper, long, gradual switchbacks should be used rather than short, steep switchbacks.

D.G. 2.3 Accessible Trails

D.G. 2.3.1 American With Disabilities Act (ADA). Where feasible, the design of County trails should recognize the intent of the ADA and should emphasize accessibility for everyone. To determine feasibility and the degree to which trails will be designed for whole-access, the overall terrain conditions of the area surrounding the trail route will be referenced. As an initial reference, three general accessibility zones are: Valley Floors/Coastal Plain; Foothills; and Canyon/Mountain. Table 4.2 defines the general slope characteristics of each of these zones. The final definition of each zone as it pertains to a particular trail alignment should be made only after detailed site investigations have been conducted.

Table 4.2: Ranking Access Conditions by Topography

| Criteria | Accessibility Zone* | | |
|--|---|--|---|
| | Easy Level of Access (e.g. Valley Floor / Coastal Plain) | Moderate Level of Access (e.g. Foothills) | Difficult level of Access (e.g. Canyon / Mountain) |
| Average slope conditions over entire area of trail | < 10% | 11% - 20% | > 20% |

D.G. 2.3.2 Access Zones. Table 4.3 summarizes trail design criteria to be used for the three general accessibility zones. All County trail routes in unincorporated County jurisdiction within the Valley Floor zone should be designed to meet guidelines presented in Table 4.3. Trails within Foothills and Canyon/Mountain zones should be evaluated on a case-by-case basis.

D.G. 2.4 Sight Distance

Clearing widths of Multiple-use and Limited-use trails involving bicycles should be developed to assure a 100-foot average sight distance where possible. If sight distances on curves, around hills or through densely vegetated areas are less than 100 feet, safety signs and reduced speed limits should be implemented.

D.G. 2.5 Trail Undercrossings

Where a County trail must pass under a highway bridge, sufficient vertical clear-space and security lighting should be provided to accommodate trail use. Where the provision of such spaces is not possible, alternative trail tread textures should be provided and safety signs placed on either side of the undercrossing involved to inform trail users of such conditions and the appropriate use conditions to follow, such as reducing speeds or dismounting.

Table 4.3: Summary of Accessible Design Guidelines for Trails¹

| Design Component | Accessibility Zone | | |
|---|--|--|---|
| | Easy Level of Access (e.g. Valley Floor) | Moderate Level of Access (e.g. Foothills) | Difficult level of Access (e.g. Mountains) |
| Maximum running slope | 8.33% | 10% | 12.5% |
| Maximum interval of 5ft. by 5ft. passing areas ² | 200 ft. | 300 ft. | 400 ft. |
| Optimum trail tread | 5 ft. 0 in. | 5 ft. 0 in. | 4 ft. 0 in. |
| Rest area interval | 600 ft. | 900 ft. | optional |
| Maximum ramp gradient | 10% | 12.5% | 15% |
| Maximum ramp rise to landing | 48 in. | 60 in. | 72 in. |
| Maximum ramp run to landing | 40 ft. | 40 ft. | 40 ft. |
| Maximum tread cross-slope | 3% | 5% | 5% |
| Minimum vertical clearance ³ | 6 ft. 8 in. | 6 ft. 8 in. | 6 ft. 8 in. |

¹ Based on guidelines developed in cooperation with Federal agencies.

² Not required if trail is a minimum of 5ft. in width

³ Single-purpose Hiking Trail Only

D.G. 2.6 Speed Limits

A speed limit of at least 15 miles per hour (MPH) shall be placed on all trails that permit cyclists and other trail uses (e.g., pedestrian, equestrian). Signs shall be located at trail entrances that indicate that a speed limit is in effect.

D.G. 3.0 TRAIL MATERIALS AND CONSTRUCTION PRACTICES

D.G. 3.1 Machine vs. Hand Construction

Machine construction of trails is the most cost-effective in the majority of cases. Hand construction of trails is preferable where opportunities for use of volunteer labor exist or where potential impacts to land or habitat resources, and subsequent mitigation costs, would be exacerbated by machine construction.

D.G. 3.2 Minimum Disturbance

Trail development should be limited to the minimum construction necessary to provide for public safety and to protect natural and cultural resources.

D.G. 3.3 Recycle

When feasible, recycled materials should be used in the construction of trails.

D.G. 3.4 Construction Limits

Visible evidence of trail construction should be confined to the trail clearing limit.

D.G. 3.5 Clearing Width and Height

The minimum horizontal clearing width from physical obstructions varies based on the type of trail but should be no less than 2 feet from the outer limits of the trail tread and shall be determined on a case by case basis to protect special natural features. Minimum vertical distance from overhanging branches shall be 12 feet on trails open to equestrian or bicycle use. Minimum vertical distance from overhanging branches shall be 7 feet on hiking trails. Clearing shall be determined on a case-by-case basis to protect special natural features.

D.G. 3.6 Trail Surfaces

D.G. 3.6.1 Material. Where feasible, trail treads should be of materials that provide a firm, smooth surface meeting the requirements of the most current Americans with Disabilities Act Accessibility Guidelines for Outdoor Developed Areas.

D.G. 3.6.2 Surface. Trail surfaces appropriate to intended use shall be selected so as to minimize runoff and erosion problems.

D.G. 3.7 Grading and Drainage

D.G. 3.7.1 Extent of Grading. No large-scale grading shall be used for trail construction unless in conjunction with a development project where large-scale grading has been found acceptable. Trail designs shall conform to the County Excavating, Grading, Filling, and Clearing Ordinance.

D.G. 3.7.2 Cut and Fill. The degree of cut allowed on a slope depends on the soil type, hardness, and surrounding natural resources. Ultimate cuts shall be contoured to blend with the natural slopes. Berms of earth, rocks or wood on the outside of the trail may be necessary. Steep areas shall be handled by limited terracing or building steps to avoid large-scale grading. Steps must be reinforced with stone or wood.

D.G. 3.7.3 Soil Disturbance. In order to reduce erosion and maintenance problems, disturbance of the soil surface shall be kept to a minimum. Only those rocks, stumps and roots, which interfere with safe passage, shall be removed.

D.G. 3.7.4 Drainage. Trail designs shall comply with the County Surface Runoff Management Plan. Surface water shall be diverted from trails by outsloping the trail tread between 1% and 3% where feasible. Where necessary, shallow ditches or water bars shall be used to divert water on running slopes greater than 5%. Other trail drainage techniques may include rolling dips, culverts, or ditches on sides of trails.

D.G. 3.7.5 Erosion Control Plans. Where a potential for significant soil erosion exists along a new trail alignment, specific erosion control plans shall be prepared by a qualified professional. Criteria to be used in determining the erosion potential includes: slope, soil type, soil composition and permeability and the relative stability of the underlying geologic unit. The erosion control plans shall comply with erosion control policies in the San Mateo County General Plan and San Mateo County Local Coastal Program.

D.G. 3.8 Planting of Disturbed Areas

Any cut or fill slopes shall be immediately reseeded or replanted with vegetation native to the general area. Criteria that would be used in selecting plant materials include, but is not limited to: if the species is indigenous to the area; habitat value; rate of growth; ultimate size; fire resistance; strength of root system; resistance to pests and diseases; aesthetic

characteristics; ability to provide shade; and ease of maintenance. Noxious plants (e.g. Yellow Star Thistle) shall be controlled within the trail setting.

D.G. 3.9 Cultural Resource Protection

D.G. 3.9.1 Avoidance. Trail design shall avoid adverse impacts to cultural resources. If avoidance is not possible, impacts should be minimized by avoiding areas where resources are known to exist.

D.G. 3.9.2 Buried Resources. During excavation of each individual trail, construction personnel shall look out for buried archaeological resources and human remains. If these resources are discovered, construction shall cease until a qualified archaeologist has studied the resources. All identified archaeological sites shall be evaluated using the California Register of Historical Resources criteria. The archaeologist shall identify the proper course of action to reduce project impacts on cultural resources. This shall include studying and reporting on the site to ensure that data is available to future researchers. Material recovered shall be donated to an appropriate repository for future study.

D.G. 3.9.3 Human Remains/ Objects. If prehistoric archaeological deposits that include human remains or objects considered “cultural items” according to the Native American Graves Protection and Repatriation Act are discovered during construction, the County Coroner and a qualified archaeologist shall be notified immediately and NAGPRA regulations shall be followed. If the remains are identified as American Indian, the tribe(s) shall be notified within one (1) working day and consultation will be initiated. Project activities may resume 30 days after notifying the tribe(s). Repatriation of the other categories of items (funerary objects, sacred objects, and cultural patrimony) shall be based on evidence that indicates whether or not the original acquisition of the object was from an individual that had the authority to separate the item from the tribal group.

D.G. 3.10 Air Quality

Parking surfaces and trail materials that reduce dust shall be used. Dust suppression techniques, including watering of disturbed lands, should be used in constructing multiple-use trails to reduce dust during trail construction.

D.G. 4.0 TRAIL STRUCTURES

D.G. 4.1 Drainage Crossings

Trails crossing creeks and drainages may require a bridge or culvert. Culverts should be as wide as the active stream channel so that they do not limit the ability of debris to pass. Sufficient depth and velocity of water through the culvert shall exist in fish-bearing streams for passage of species concerned. Regular maintenance of drainage structures shall be performed to ensure proper functioning. Structures over water courses shall be carefully placed to minimize disturbance and should be located 2 feet above the 100-year flood elevation or 2 feet above the Flood Hazard Flood Insurance Rate Map flood elevation. Erosion control measures shall be taken to prevent erosion at the outfalls of drainage structures. Flow of runoff will be directed to vegetated areas, away from creeks and drainages.

D.G. 4.2 Trail Bridges

Bridges should be a minimum of 5 feet wide on hiking and equestrian and a minimum of 8 feet wide on a natural-surfaced multiple-use trail. Bridges for paved multiple-use trails

should be a minimum of 12 feet wide and structurally capable of carrying maintenance vehicles. All bridges must have minimum 42-inch high railings when necessary. Fill over culverts should match the trail width. Bridge footings should be constructed outside of the stream's top of bank.

D.G. 4.3 Hardware

All trail structures should be designed to be as vandal-proof as possible. Rounded framing members and recessed bolt heads and other hardware should be used for safety.

D.G. 4.4 Access and Safety Barriers

D.G. 4.4.1 Types of Barriers. Bollards, boulders, logs, stiles and/or other structures shall be used to prevent motorized vehicles from entering trail routes at any crossing of a public road right-of-way or at any trail staging area. Barriers shall be designed to comply with the latest Americans with Disabilities Act (ADA) Accessibility Guidelines for Outdoor Developed Areas at trails designated as ADA accessible.

D.G. 4.4.2 Heavy Travel. Safety barriers, grade separations and/or barrier plantings shall be provided to protect trail routes along heavily traveled roads.

D.G. 4.4.3 Gates. Gates installed for trail users should be four to five feet in width and able to be easily closed or self-closing. Vehicle gates, where necessary, should be signed to prevent blockage.

D.G. 4.5 Signs

Sign standards should be adopted for all County trails, using the same style and design. International symbols should be used on signs. Six types of signs should be considered in management plans for each County trail (D.G. 4.3.1 through D.G. 4.3.6).

D.G. 4.5.1 Identity Signs. Identity signs portraying information to include: trail name and distance to staging areas; intersections with other trails; or other points of interest along the trail route. Identity signs should be located at all staging areas, County trails intersections, intersections with other trails as appropriate and intersections with roads.

D.G. 4.5.2 Use Signs. Use signs portraying which types of trail use are appropriate, permitted or prohibited on the trail; identifying accessibility conditions and other ADA related information; educating trail users about respecting private property along the trail route and/or any special land use considerations; and prohibiting smoking and the use of matches or lighters. Use signs should be placed at each trail staging area. Information about litter control shall be included in use signs located at trail access points.

D.G. 4.5.3 Safety Signs. Safety signs displaying warnings of upcoming underpasses, street intersections, blind curves, vertical clearances; providing information about water availability along the trail; advising trail users of the need to reduce speed or dismount and walk their bicycles or horses; warning of mountain lion or other wildlife danger; identifying any use restrictions during the fire season; and explaining the hierarchy of yielding among trail users. Safety signs should be located on an as-needed basis.

D.G. 4.5.4 Private Property Signs. Private property signs should be posted at regular intervals in conformance with legal requirements to remind the trail user not to trespass, as appropriate.

D.G. 4.5.5 Interpretive and Protective Signs. Interpretive and protective signs indicating natural resource or historical points of interest or sensitive areas. Signs would be designed to identify specimen habitat types and to be educational by briefly describing resource characteristics and values.

D.G. 4.5.6 Regional Signs. Regional signs posted at strategic locations to direct regional traffic to staging areas and away from neighborhoods which may have trail access points but do not have sufficient parking to accommodate such use.

D.G. 4.6 Potable Water

Potable water for trail users should be provided at least every 5 miles along Regional Trails, as appropriate. A sign shall be posted at every trail entrance stating that hikers must carry their own water when potable water is not available on the trail.

D.G. 4.7 Non-Potable Water

Water for domestic animals permitted on the trail should be provided at major access points and at an optimum of 5-mile intervals along Regional and Sub-regional Trails, as appropriate.

D.G. 4.8 Sanitary Facilities

Sanitary facilities should be located at all Parks and Open Space Preserves that are sited along the trail system and at staging areas, as appropriate. The facilities shall be sited to minimize maintenance cost and time. Where necessary, based on anticipated types and volumes of use, sanitary facilities shall be located along trails. The sanitary facilities shall be fully ADA accessible, if feasible.

D.G. 4.9 Benches

Benches for resting should be provided at regular intervals within 1/2 mile of formal staging areas along trail routes where use levels are significant, as appropriate. These should be located at places with aesthetic qualities, viewpoints and particularly at the end of any long uphill stretches. Benches shall meet the County of San Mateo Parks and Recreation Division standards. Any dedication shall be in conformity with the County Parks and Recreation Division gifts and donation policies.

D.G. 4.10 Stream Access Points

In the detail design of any trail alignment parallel to a freshwater stream zone or estuary, access points should be identified for environmental education and interpretive programs. Such access points should be sited in coordination with the California Department of Fish and Game, the U.S. Army Corps of Engineers, and other jurisdictional agencies as appropriate.

D.G. 4.11 Wildland Fire Suppression

During preparation of design plans for specific trail alignments, the County Parks Division shall:

- Review, in conjunction with the local fire protection services, available water sources.
- Select indigenous plant materials and/or seed mixes utilized at staging areas or along trails for their low maintenance and drought and fire resistant characteristics to minimize additional fuel available to wildland fires to the maximum extent feasible.

D.G. 4.12 Emergency Telephones

Along trails located outside of public parks and along trails that pass through more remote areas or private lands, consider installing solar-powered emergency telephones at regular intervals, as appropriate.

D.G. 4.13 Visual Screening

D.G. 4.13.1 Screening. Screening berms, perimeter planting, and parking area trees that provide a canopy shall be used at Regional Staging Areas to visually buffer views into the staging area from sensitive view points, or to block views of incompatible surrounding land uses as seen from inside the staging area.

D.G. 4.13.2 Structures. All structures proposed that are located in scenic corridors shall be screened using landscaping.

D.G. 4.13.3 Lighting. Any restrooms proposed as a part of any trail segment in a scenic corridor shall use warm toned security lighting in outside areas that is directed towards the ground.

D.G. 4.13.4 Utilities. All utilities constructed as a part of this project, within a State scenic corridor, shall be underground.

D.G. 4.14 Receptacles

D.G. 4.14.1 Placement. Trash receptacles shall be included at staging areas, where feasible, slightly beyond the beginning point of a trail where it is accessible to maintenance vehicles but not accessible to public vehicular access.

D.G. 4.14.2 Logistics. Recycling receptacles, which accept glass, metal, and plastic, shall be included at staging areas, where feasible. Recycled materials shall be picked up as part of the routine maintenance of the trails and brought to a recycling facility.

4.3 Use and Management Guidelines

M.G. 1.0 GENERAL

M.G. 1.1 Day-Use Management

County trails are intended for day-use only except when within a public road right-of-way or when a special permit is obtained. When requested by a property owner, gates that provide access to private property shall be securely locked by the managing agency to avoid unauthorized entry.

M.G. 1.2 Trails and Trail Users

The Parks and Recreation Division shall determine if an individual trail will be a Multi-Use trail. Trail uses should be consolidated where safe within the same trailway, depending on the steepness, available right-of-way, safety, user frequencies, and other conditions. A type of use on a trail may be prohibited for safety or environmental reasons, such as erosion and water quality.

M.G. 1.3 Trail Use Restrictions

M.G. 1.3.1 User Types. Where a trail is restricted to a particular type of user(s) because of conditions listed above, the trail shall be clearly designated as such and shall be equipped with use signs and appropriate barriers to discourage unauthorized use.

Appendix 5

EXCERPTS FROM N.R.C.S. WEB SOIL SURVEY

Camp Areas, Off-Road Motorcycle Trails, and Paths and Trails (CA)

The soils of the survey area are rated in this table according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate to which the soils are limited by all of the soil features that affect the recreational uses. "No limitations" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Limitations" indicates that the soil has features that are favorable to unfavorable for the specified use. The table identifies only the top limitations for any given soil. The limitations listed can be overcome or minimized by special planning, design, or installation. Fair to poor performance and moderate to high maintenance can be expected, depending on the number of limitations and the severity of each limitation.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in this table can be supplemented by other information, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, saturated hydraulic conductivity (Ksat), and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, Ksat, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Report—Camp Areas, Off-Road Motorcycle Trails, and Paths and Trails (CA)

The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top limitations for any given soil. The soil may have additional limitations]

| Camp Areas, Off-Road Motorcycle Trails, and Paths and Trails (CA)— San Mateo Area, California | | | | | | | |
|---|------------------|------------------------------------|-------|------------------------------------|-------|------------------------------------|-------|
| Map symbol and soil name | Pct. of map unit | Camping areas (CA) | | Paths and trails (CA) | | Off-road motorcycle trails (CA) | |
| | | Rating class and limiting features | Value | Rating class and limiting features | Value | Rating class and limiting features | Value |
| GIB—Gazos-Lobitos silt loams, gently sloping | | | | | | | |
| Gazos | 40 | Limitations | | Limitations | | Limitations | |
| | | Dusty | 0.50 | Dusty | 0.50 | Dusty | 0.50 |
| Lobitos | 40 | Limitations | | Limitations | | Limitations | |
| | | Dusty | 0.50 | Dusty | 0.50 | Dusty | 0.50 |
| GIC2—Gazos-Lobitos silt loams, sloping, eroded | | | | | | | |
| Gazos | 40 | Limitations | | Limitations | | Limitations | |
| | | Dusty | 0.50 | K-factor >.35 and slopes > 8% | 1.00 | Dusty | 0.50 |
| | | Slopes 8 to 15% | 0.37 | Dusty | 0.50 | | |
| Lobitos | 40 | Limitations | | Limitations | | Limitations | |
| | | Dusty | 0.50 | K-factor >.35 and slopes > 8% | 1.00 | Dusty | 0.50 |
| | | Slopes 8 to 15% | 0.37 | Dusty | 0.50 | | |

| Camp Areas, Off-Road Motorcycle Trails, and Paths and Trails (CA)– San Mateo Area, California | | | | | | | |
|---|------------------|------------------------------------|-------|------------------------------------|-------|------------------------------------|-------|
| Map symbol and soil name | Pct. of map unit | Camping areas (CA) | | Paths and trails (CA) | | Off-road motorcycle trails (CA) | |
| | | Rating class and limiting features | Value | Rating class and limiting features | Value | Rating class and limiting features | Value |
| GID2—Gazos-Lobitos silt loams, moderately steep, eroded | | | | | | | |
| Gazos | 40 | Limitations | | Limitations | | Limitations | |
| | | Slopes > 15% | 1.00 | K-factor >.35 and slopes > 8% | 1.00 | Dusty | 0.50 |
| | | Dusty | 0.50 | Slopes 15 - 25% | 0.92 | | |
| | | | | Dusty | 0.50 | | |
| Lobitos | 40 | Limitations | | Limitations | | Limitations | |
| | | Slopes > 15% | 1.00 | K-factor >.35 and slopes > 8% | 1.00 | Dusty | 0.50 |
| | | Dusty | 0.50 | Slopes 15 - 25% | 0.92 | | |
| | | | | Dusty | 0.50 | | |
| GIE2—Gazos-Lobitos silt loams, steep, eroded | | | | | | | |
| Gazos | 40 | Limitations | | Limitations | | Limitations | |
| | | Slopes > 15% | 1.00 | Slopes > 25% | 1.00 | Slopes 25 to 40% | 0.96 |
| | | Dusty | 0.50 | K-factor >.35 and slopes > 8% | 1.00 | Dusty | 0.50 |
| | | | | Dusty | 0.50 | | |
| Lobitos | 40 | Limitations | | Limitations | | Limitations | |
| | | Slopes > 15% | 1.00 | Slopes > 25% | 1.00 | Slopes 25 to 40% | 0.96 |
| | | Dusty | 0.50 | K-factor >.35 and slopes > 8% | 1.00 | Dusty | 0.50 |
| | | | | Dusty | 0.50 | | |
| GIF—Gazos-Lobitos silt loams, very steep | | | | | | | |
| Gazos | 40 | Limitations | | Limitations | | Limitations | |
| | | Slopes > 15% | 1.00 | Slopes > 25% | 1.00 | Slopes > 40% | 1.00 |
| | | Dusty | 0.50 | K-factor >.35 and slopes > 8% | 1.00 | Dusty | 0.50 |
| | | | | Dusty | 0.50 | | |
| Lobitos | 40 | Limitations | | Limitations | | Limitations | |
| | | Slopes > 15% | 1.00 | Slopes > 25% | 1.00 | Slopes > 40% | 1.00 |
| | | Dusty | 0.50 | K-factor >.35 and slopes > 8% | 1.00 | Dusty | 0.50 |
| | | | | Dusty | 0.50 | | |

| Camp Areas, Off-Road Motorcycle Trails, and Paths and Trails (CA)– San Mateo Area, California | | | | | | | |
|---|------------------|------------------------------------|-------|------------------------------------|-------|---|-------|
| Map symbol and soil name | Pct. of map unit | Camping areas (CA) | | Paths and trails (CA) | | Off-road motorcycle trails (CA) | |
| | | Rating class and limiting features | Value | Rating class and limiting features | Value | Rating class and limiting features | Value |
| Rb—Rough broken land | | | | | | | |
| Rough broken land | 50 | Not rated | | Not rated | | Not rated | |
| Lithic xerorthents | 35 | Not rated | | Limitations | | Limitations | |
| | | | | Slopes > 25% | 1.00 | Slopes > 40% | 1.00 |
| SbF2—Santa Lucia stony loam, very steep, eroded | | | | | | | |
| Santa lucia | 75 | Limitations | | Limitations | | Limitations | |
| | | Slopes > 15% | 1.00 | Slopes > 25% | 1.00 | Slopes > 40% | 1.00 |
| | | Fragments >10" .1 to 3% | 0.76 | Fragments >10" .1 to 3% | 0.76 | Surface fragments (>10") .1-3% coverage | 0.76 |
| | | Dusty | 0.50 | Dusty | 0.50 | Dusty | 0.50 |
| | | Fragments (<3") 25-50% | 0.41 | | | | |

| Camp Areas, Off-Road Motorcycle Trails, and Paths and Trails (CA)– San Mateo County, Eastern Part, and San Francisco County, California | | | | | | | |
|---|------------------|------------------------------------|-------|------------------------------------|-------|------------------------------------|-------|
| Map symbol and soil name | Pct. of map unit | Camping areas (CA) | | Paths and trails (CA) | | Off-road motorcycle trails (CA) | |
| | | Rating class and limiting features | Value | Rating class and limiting features | Value | Rating class and limiting features | Value |
| 104—Alambique-McGarvey complex, 30 to 75 percent slopes | | | | | | | |
| Alambique | 45 | Limitations | | Limitations | | Limitations | |
| | | Slopes > 15% | 1.00 | Slopes > 25% | 1.00 | Slopes > 40% | 1.00 |
| | | Fragments (<3") 25-50% | 0.50 | Dusty | 0.50 | Dusty | 0.50 |
| | | Dusty | 0.50 | | | | |
| Mcgarvey | 35 | Limitations | | Limitations | | Limitations | |
| | | Slopes > 15% | 1.00 | Slopes > 25% | 1.00 | Slopes > 40% | 1.00 |
| | | Permeability is .06-.6"/hr | 0.96 | | | | |

| Camp Areas, Off-Road Motorcycle Trails, and Paths and Trails (CA)– San Mateo County, Eastern Part, and San Francisco County, California | | | | | | | |
|---|------------------|------------------------------------|-------|------------------------------------|-------|------------------------------------|-------|
| Map symbol and soil name | Pct. of map unit | Camping areas (CA) | | Paths and trails (CA) | | Off-road motorcycle trails (CA) | |
| | | Rating class and limiting features | Value | Rating class and limiting features | Value | Rating class and limiting features | Value |
| 105—Barnabe-Candlestick complex, 30 to 75 percent slopes | | | | | | | |
| Barnabe | 45 | Limitations | | Limitations | | Limitations | |
| | | Slopes > 15% | 1.00 | Slopes > 25% | 1.00 | Slopes > 40% | 1.00 |
| | | Fragments (<3") > 50% | 1.00 | | | | |
| | | Bedrock depth < 20" | 1.00 | | | | |
| Candlestick | 35 | Limitations | | Limitations | | Limitations | |
| | | Slopes > 15% | 1.00 | Slopes > 25% | 1.00 | Slopes > 40% | 1.00 |
| 109—Candlestick-Barnabe complex, 30 to 50 percent slopes | | | | | | | |
| Candlestick | 45 | Limitations | | Limitations | | Limitations | |
| | | Slopes > 15% | 1.00 | Slopes > 25% | 1.00 | Slopes > 40% | 1.00 |
| Barnabe | 25 | Limitations | | Limitations | | Limitations | |
| | | Slopes > 15% | 1.00 | Slopes > 25% | 1.00 | Slopes > 40% | 1.00 |
| | | Fragments (<3") > 50% | 1.00 | | | | |
| | | Bedrock depth < 20" | 1.00 | | | | |

Data Source Information

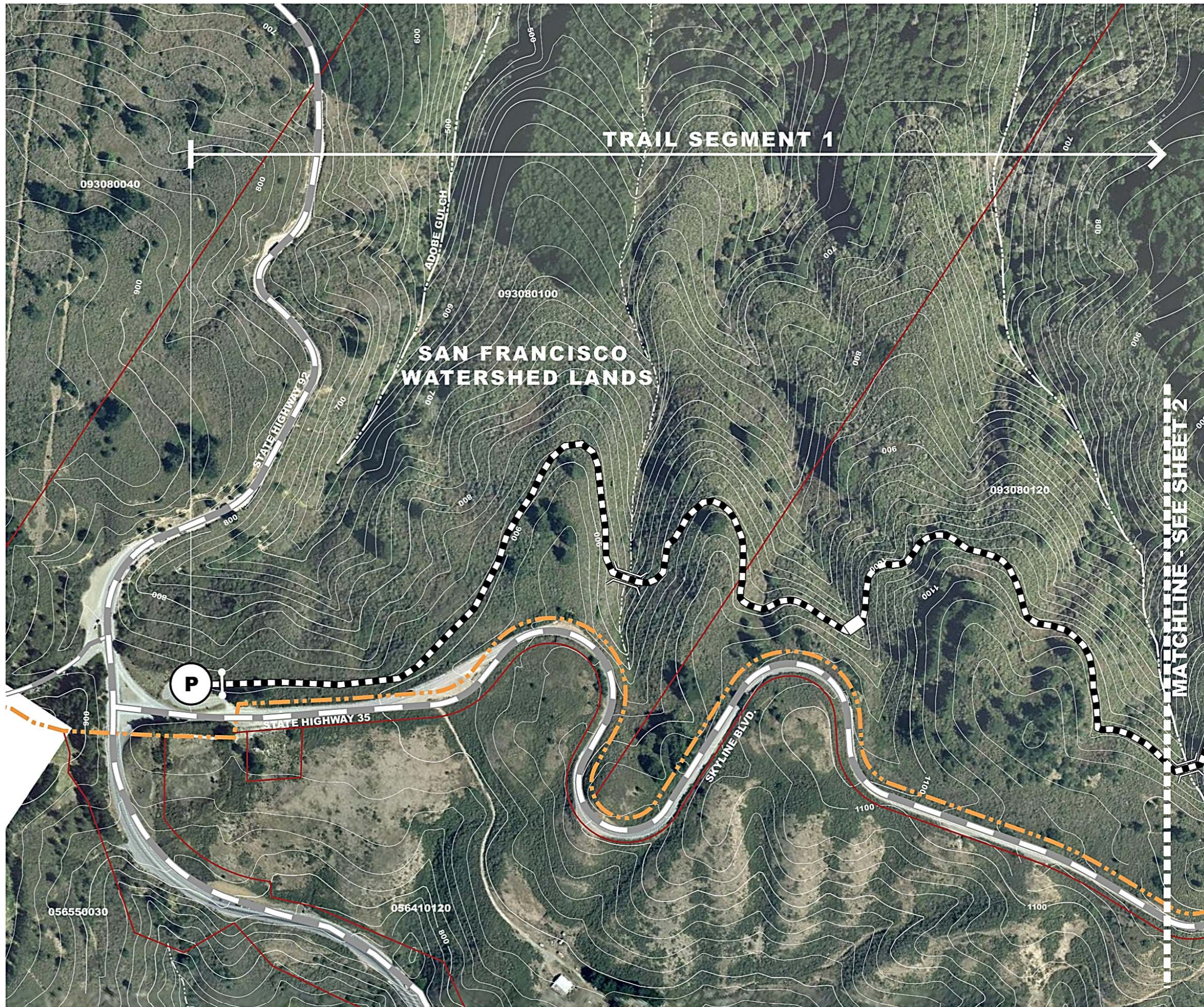
Soil Survey Area: San Mateo Area, California

Survey Area Data: Version 3, Dec 14, 2006


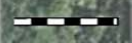














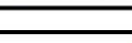
Soil Survey Area: San Mateo County, Eastern Part, and San Francisco County, California

Survey Area Data: Version 4, Dec 14, 2006

BAY AREA RIDGE TRAIL HIGHWAY 92 TO HUDDART PARK



LEGEND

-  PROPOSED BAY AREA RIDGE TRAIL - PREFERRED ALIGNMENT
-  PROPOSED BAY AREA RIDGE TRAIL - ALTERNATE ALIGNMENT
-  BRIDGE OR CULVERT
-  FORD (LOW WATER CROSSING)
-  PROPOSED GATE
-  EXISTING GATE
-  EXISTING TRAILS
-  STREET
-  EXISTING PARKING
-  POSSIBLE NEW PARKING
-  EXISTING PARKING WITH RESTROOM
-  PUBLIC AGENCY LAND BOUNDARY
-  OTHER PROPERTY LINE
-  USGS BLUE LINE STREAM
-  NOT USGS BLUE LINE STREAM
-  INTERMEDIATE CONTOURS
-  INDEX CONTOUR

Contour
Interval:
20 feet



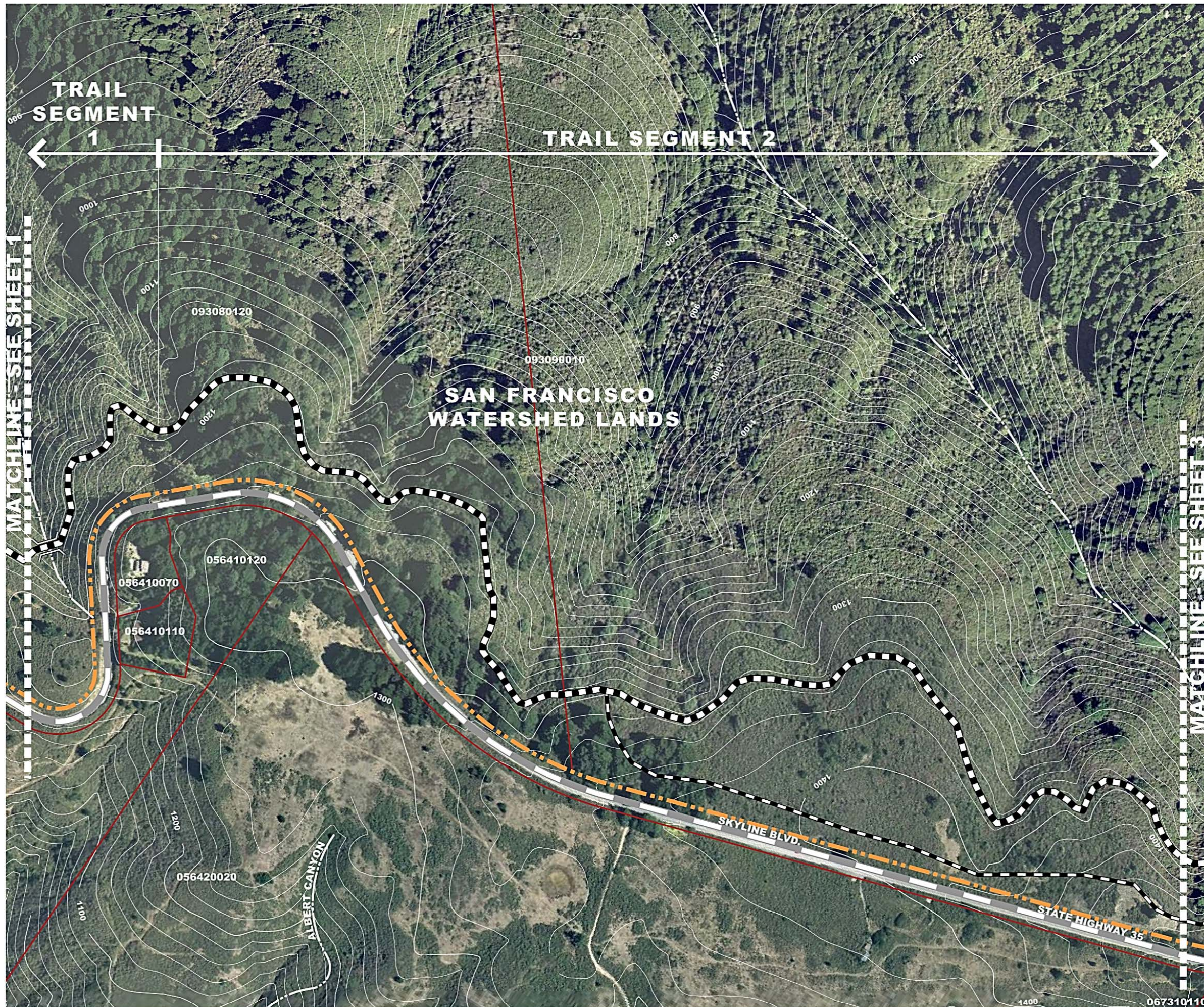
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BAY AREA RIDGE TRAIL HIGHWAY 92 TO HUDDART PARK



LEGEND

- PROPOSED BAY AREA RIDGE TRAIL - PREFERRED ALIGNMENT
- PROPOSED BAY AREA RIDGE TRAIL - ALTERNATE ALIGNMENT
- BRIDGE OR CULVERT
- FORD (LOW WATER CROSSING)
- PROPOSED GATE
- EXISTING GATE
- EXISTING TRAILS
- STREET
- EXISTING PARKING
- POSSIBLE NEW PARKING
- EXISTING PARKING WITH RESTROOM
- PUBLIC AGENCY LAND BOUNDARY
- OTHER PROPERTY LINE
- USGS BLUE LINE STREAM
- NOT USGS BLUE LINE STREAM
- INTERMEDIATE CONTOURS
- INDEX CONTOUR

Contour Interval: 20 feet

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BAY AREA RIDGE TRAIL HIGHWAY 92 TO HUDDART PARK



LEGEND

- PROPOSED BAY AREA RIDGE TRAIL - PREFERRED ALIGNMENT
 - PROPOSED BAY AREA RIDGE TRAIL - ALTERNATE ALIGNMENT
 - BRIDGE OR CULVERT
 - FORD (LOW WATER CROSSING)
 - PROPOSED GATE
 - EXISTING GATE
 - EXISTING TRAILS
 - STREET
 - EXISTING PARKING
 - POSSIBLE NEW PARKING
 - EXISTING PARKING WITH RESTROOM
 - PUBLIC AGENCY LAND BOUNDARY
 - OTHER PROPERTY LINE
 - USGS BLUE LINE STREAM
 - NOT USGS BLUE LINE STREAM
 - INTERMEDIATE CONTOURS
 - INDEX CONTOUR
- Contour Interval: 20 feet

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NORTH

3 of 7

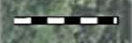








BAY AREA RIDGE TRAIL HIGHWAY 92 TO HUDDART PARK



MATCHLINE SEE SHEET 3

MATCHLINE SEE SHEET 5

LEGEND

-  PROPOSED BAY AREA RIDGE TRAIL - PREFERRED ALIGNMENT
-  PROPOSED BAY AREA RIDGE TRAIL - ALTERNATE ALIGNMENT
-  BRIDGE OR CULVERT
-  FORD (LOW WATER CROSSING)
-  PROPOSED GATE
-  EXISTING GATE
-  EXISTING TRAILS
-  STREET
-  EXISTING PARKING
-  POSSIBLE NEW PARKING
-  EXISTING PARKING WITH RESTROOM
-  PUBLIC AGENCY LAND BOUNDARY
-  OTHER PROPERTY LINE
-  USGS BLUE LINE STREAM
-  NOT USGS BLUE LINE STREAM
-  INTERMEDIATE CONTOURS
-  INDEX CONTOUR

Contour Interval: 20 feet



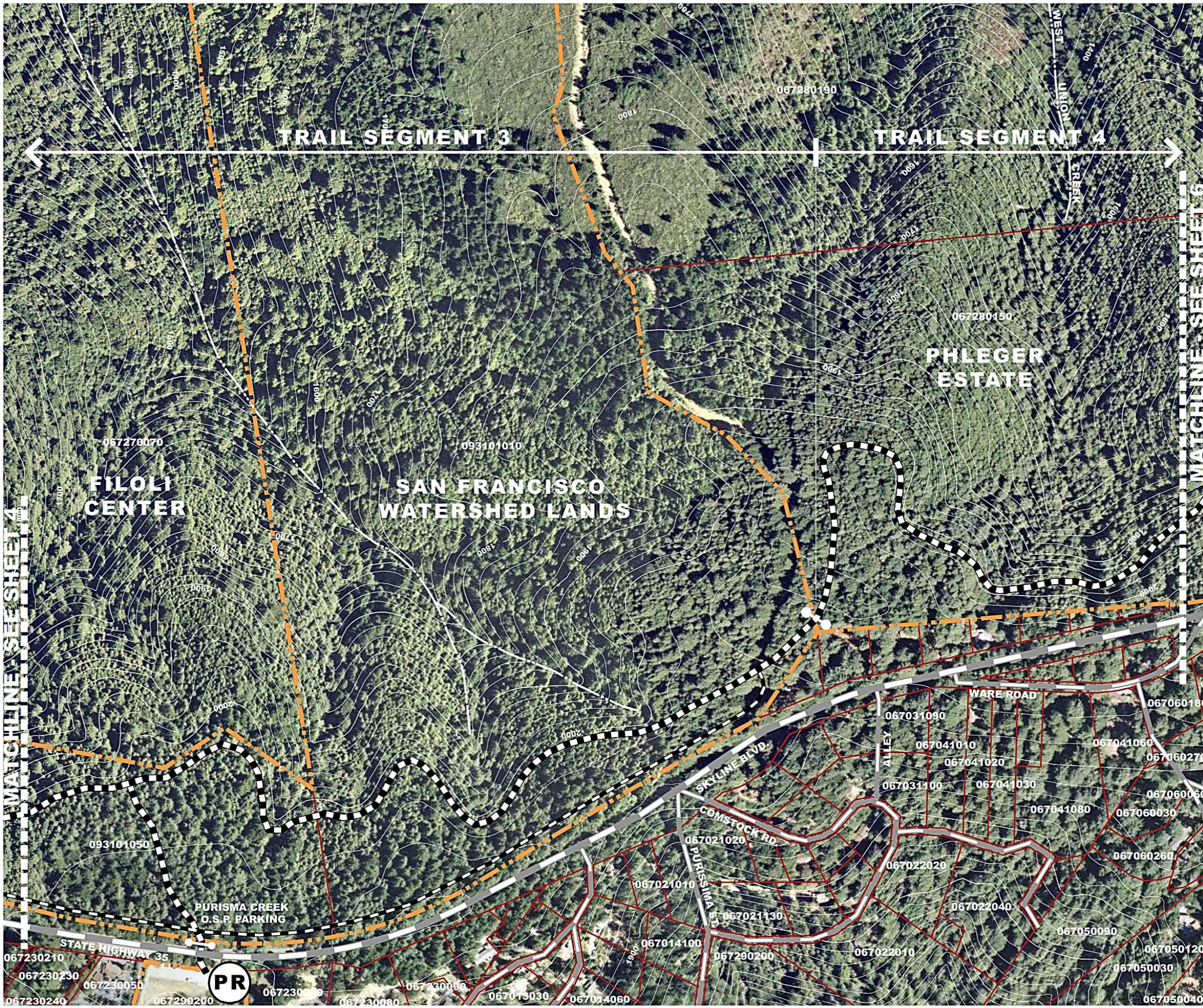
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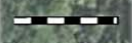













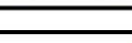

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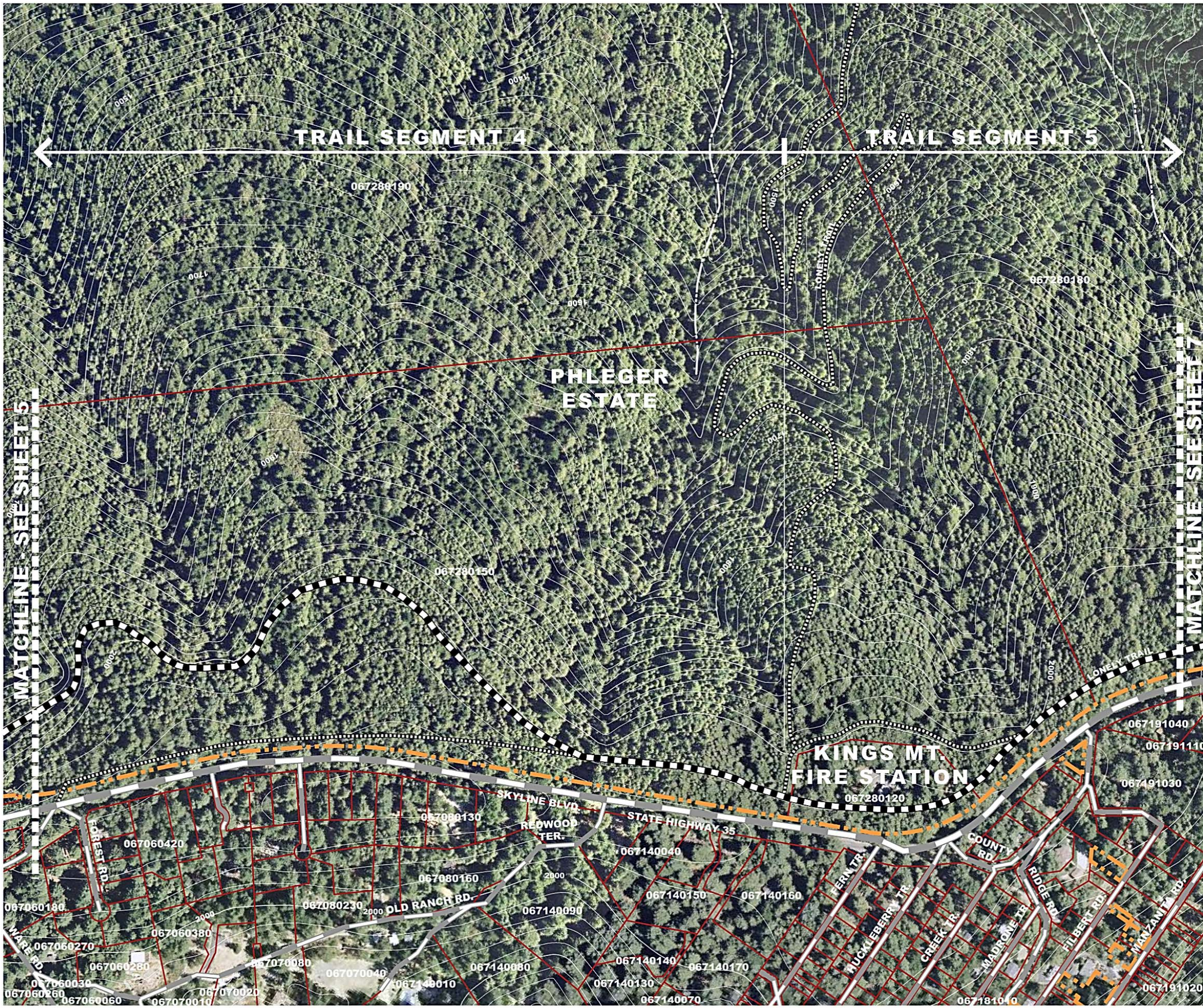
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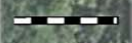








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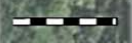















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